GENERAL LIBRARY
SEP 20 1918
UNIVERSITY OF MICHIGAN
CHEMICAL LIBRARY

The Journal.—August 13, 1918. Registered as a Newspaper.

GAS JOURNAL

LIGHT • HEAT • POWER • BYE-PRODUCTS

[Founded in 1849 as the "Journal of Gas Lighting."]

VOL. CXLIII. No. 2883.] LONDON, AUGUST 13, 1918. [70TH YEAR. PRICE 6d.

O'NEILL'S
OXIDE
GAS PURIFICATION AND CHEMICAL CO., Ltd.
PALMERSTON HOUSE, LONDON, E.C.
Telegrams: "PURIFICATION, LONDON."
Telephone: 9144 LONDON WALL.

PUMPING ENGINES
All Types for ACID, &c.
CAST-IRON OR STEEL TANKS
Any Capacity.
CHEMICAL PLANT.
Roofs and Girders. Structural Work.
SULPHATE OF AMMONIA PLANT
Air and Gas Compressors.
MIXERS.
TAR STILLS AND CONDENSERS.
W. NEILL & SON, LD.
Engineers, Iron & Brass Founders,
ST. HELENS JUNCTION.
Telegrams: 'NEILL, ST. HELENS.' Telephone No. 20.

PURIFYING MATERIAL
"Brownox-de-Luxe."
Unqualified Satisfaction given where used.
SPENT OXIDE PURCHASED
J. BROWN & CO., Ltd.
Savile Town, DEWSBURY.

TORBAY
JOINT STOPPING
FREE FROM LEAD.
The TORBAY PAINT CO.,
26/28, Billiter St., LONDON, E.C. 3.
39/41, Old Hall St., LIVERPOOL.

"BLUEBELL"
SILICA RETORTS
(95% SILICA)
John G. Stein & Co., Ltd.,
Castlecary, SCOTLAND.

Makers of
GASHOLDERS,
TANKS (C.I. or Steel),
PURIFIERS,
WASHERS,
ROOFS,
&c.
ASHMORE, BENSON, PEASE & CO., LTD.,
STOCKTON-ON-TEES.
Complete GAS WORKS
London Office
82, Victoria Street, Westminster, S.W.
Telegrams: "GASHOLDER."

W. & B. COWAN
(Incorporated in Parkinson and W. & B. Cowan, Ltd.),
LONDON. MANCHESTER. EDINBURGH. GLASGOW.
SYDNEY. MELBOURNE. BRISBANE. WELLINGTON, N.Z.
(See Advertisement on page iii. of Wrapper.)

JAMES McKELVIE & CO.
Coal Owners,
Gas and Steam Coal Contractors,
17, RUTLAND SQUARE, EDINBURGH.
59, MARK LANE, LONDON, E.C.
GUILDHALL CHAMBERS, SANDHILL, NEWCASTLE-ON-TYNE.
24, CHAPEL STREET, LIVERPOOL.
ESTABLISHED 1840.

STEWARTS AND LLOYDS, LIMITED, 41, OSWALD STREET, GLASGOW. BROAD STREET CHAMBERS, BIRMINGHAM.
TUBES & FITTINGS for Gas, Steam, Water, &c.

ESTABLISHED — 1861 —
Telegrams: "DRY METERS, LONDON."
Telephone: KENSINGTON, 1140.

George Glover and Co., Ltd.
RANELAGH WORKS
Royal Avenue, Chelsea
LONDON, S.W., 3.

Highest Awards at the Principal International Exhibitions.
Branches at LEEDS (9, Dewsbury Road) and MANCHESTER (Gaythorn Meter Works, Easton St.).

SPECIALISTS IN DRY GAS METERS—SLOT, KEY, AND ORDINARY.
Every meter leaving GEORGE GLOVER AND CO.'s works, irrespective of size—and they build up to 3000 Lights—is regulated and tested for soundness at 12 in. pressure, and for registration not only at the ½ in. pressure prescribed by the "Sales of Gas Act," but at 3 in. pressure with full outlet capacity, so as to prevent "slow" registration even when the meter is overworked.
AGENTS FOR THE PATENT M. & M. SELF-LOCKING SLOT METER PADLOCK.

C.I. PIPES FOR GAS & WATER. MIDDLESBROUGH.
34, Victoria St., S.W. 1. MANCHESTER.

Every Mantle manufactured and supplied by the Welsbach Light Co., Ltd., is

BRITISH MADE

by British labour at the Welsbach Factory at Wandsworth, London, S.W. 18.

Welsbach Mantles have stood the test for well over a quarter of a century, and to-day are in greater demand than ever —a proof of their reliability.

THE ORIGINAL AND STILL THE BEST

The WELSBACH LIGHT CO. Ltd., Welsbach House, King's Cross, W.C. 1.

And at Birmingham, Bristol, Dublin, Hull, Leeds, Manchester, and Stoke-on-Trent.

GAS SERVICE REGULATORS.

PATENT No. 5093/08.

THOUSANDS IN USE.

For Gas Stoves.

Fig. 618.
For reducing from 10 ins. to 2 ins. or 3 ins.
(Half Actual Size.)

Fig. 568.
For reducing the ordinary district pressure down to any outlet pressure from 10-10ths to 50-10ths.

The Governors are also suitable for regulating the supply of gas to gas engines.
High Pressure Type supplied for Higher Inlet Pressures up to 50 lbs.

No liquid or mercury seal floats.
Do not require accurate setting.
Constant outlet pressure maintained.
Inlet pressure can vary over wide range.
Regularity of light.
(High Pressure Type also for Higher Inlet Pressure.)

For Street Lamps.

Fig. 617.
For reducing from pressures up to 10 lbs. down to inches of Water.
Male or Female Ends.

When ordering, state Outlet Pressures and Figure Number.

DISTRICT GOVERNORS. ROTARY COMPRESSORS.

Regulators sent on Trial. *Price Lists and Discounts on Application.*

THE BRYAN DONKIN CO., Ltd.,

Head Office and Works, CHESTERFIELD.

London Office: 3, VICTORIA STREET, WESTMINSTER, S.W. 1.

Chesterfield Telephone No. 84.
London Telephone No. 5358 Victoria.

Chesterfield Telegrams, "Donkin, Chesterfield."
London Telegrams, "Donkin Vic. London."

GAS JOURNAL

LIGHT ✂ HEAT ✂ POWER ✂ BYE-PRODUCTS

[Founded in 1849 as the "Journal of Gas Lighting."]

EDITOR & PUBLISHER: WALTER KING. OFFICE: 11, BOLT COURT, FLEET ST., LONDON, E.C. 4.

VOL. CXLIII., No. 2883.] TUESDAY, AUGUST 13, 1918. [70TH YEAR.

EDITORIAL NOTES.

The Relief Act and the Future.

THE Houses of Parliament temporarily ended their work last Thursday, and then adjourned until Oct. 15 for a much-needed rest. One of their final acts of grace was to pass the Statutory Undertakings (Temporary Increase of Charges) Bill through its final stages, so that it could on Thursday receive the Royal Assent in company with other Government measures. Fourteen of the group of Gas Bills seeking financial relief were withdrawn. Now interest will be transferred from Parliament to the Board of Trade, the Local Government Board, and the Scottish Office; for what, under the Act, has to be done by company or municipal owners of gas, electricity, water, and tramway undertakings who want to protect themselves with a minimum dividend or additional charge powers is, when individual conditions warrant it, to apply for an Order to the appropriate Government Department. With the recent additions to coal prices and labour payments, there should be a fair influx of applications almost immediately; and, as things are going, the volume of the steam for some little time to come should be a pretty constant one.

The new Act has larger significance than the bare relief afforded by its terms. It is a recognition that, however good the principle of the sliding-scale may be in times of fairly regular proceeding, in extraordinary times its terms require some amount of loosening in order that invested capital may not be damnified to an unreasonable extent. This recognition by Parliament is something gained; and it will be helpful when appeal is made for a more permanent revision of terms and an extension of the sliding-scale so as to meet occurrences and times which are not ordinary, and are altogether beyond the powers of management. As Sir Albert Stanley hinted, when the House of Commons was dealing with the new measure [*ante* p. 200], the financial terms under which statutory undertakings do business will after the war have to be modified, in order to make them fit in with the new economic conditions which have been created, and which will be more or less permanent, or at any rate will not return to the easier or the more flexible state that existed before the war. This being so, the industry must be prepared by investigation and compilation of information which will be necessary to its case when the question of revision of statutory enactment is taken in hand. All too often has the industry been found wanting in preparedness; and what we desire to see is that by a Special Committee—one it is hoped to be appointed by the President of the Board of Trade—investigation will be made of the current and prospective position of the industry, and a positive line of policy be defined, which shall put it in the state of being in advance rather than behind requirements. The customary situation of the industry is to be behind. But it is hoped now the turning-point has been reached, that the customary position in the future will be the reverse of that of the past.

The sharp tussle in Parliament by the industry to obtain relief from the statutory financial ties referred to during the prevalence of war conditions, and to put a stop to their destructive influence on dividends and capital values, will be the subject of comment at many meetings of proprietors the next few weeks. Mr. Charles Hunt, at the meeting of the South Suburban Company last Friday [a report appears in this issue], dealt with the subject as only one can do with an intimate knowledge of the matter, and as one who has kept close personal observation of the parliamentary proceedings. Very properly, he regards the manner in which both Houses of Parliament expressed their sense of the grave inadequacy of the relief recommended by the Select Committee as not only a complete vindication of the justice of the claim of the companies, but also as a distinct encouragement for the future. In fact, what has been done, in his view, most probably paves the way for a permanent settlement more in keeping with the greatly altered value of money and other new conditions.

As already mentioned, it is to the future we have now to look, and for the future that we have now to work. There should be no looking back, save for the purpose of gathering evidence to justify claim. What the industry is now passing through in respect of incongruity of internal with external conditions must not be permitted to occur again. Those in the industry owe it to themselves, as well as to those who succeed them, to redress a weakness and deficiency which have made themselves so strikingly and materially felt. "Everyone must now admit," said Mr. Hunt, "the viciousness of a policy which it is all too evi-"dent from the experience through which we are passing "may reduce public utility undertakings to something like "beggary through circumstances over which they cannot "exercise the least control. Certainly a more liberal policy "in this respect has become necessary." Though he helped to make some of them, Mr. Hunt admits—he cannot help this with the mass of experience before us—that standard prices and maximum prices have hitherto been fixed too low. This should be qualified by the remark that perhaps they were not for the then times. But economic conditions change; standard and maximum prices remain. So he welcomes the pronouncement of Sir Albert Stanley as to his views regarding the need of statutory revision, which so well accord with those expressed—though more in reference to technical matters—by Lord Moulton, in his Presidential Address to the Institution of Gas Engineers. The Act which has been passed by the New South Wales Legislature, which provides for the provision of standard prices under the sliding-scale according to variations in the cost of gas production and distribution (taking all circumstances into account) has its attractions for Mr. Hunt, and will no doubt be borne in mind as a convenient precedent. When there is revision here, it must be on lines that are flexible, and not be of the cast-iron form which took no thought of the economic conditions of the morrow. Members of the London County Council will note, from the report of the South Suburban meeting, that a matter that is troubling the mind of Sir Fortescue Flannery, Bart., M.P., is as to why continued prejudice is shown in all the actions of that body against the gas companies. The Council are always working for what they call justice for the consumers, but we can never discern in their proceedings even a passing thought of justice for the stockholders. Sir Fortescue ventures to say the influence of the County Council had a great deal to do with the extraordinary recommendations of the Select Committee. We have suggested as much in the "JOURNAL;" and therefore have no hesitation in thoroughly agreeing with his contention.

From current experience, and all that has been said and written, it is abundantly clear that the gas industry must do everything possible, though the work may be stiff, to prevent

in future its financial position being assailed in the manner it has been by the events of the past four years. The maintenance of its credit is a matter of great importance not only to itself, but to the consumers and the community generally. This point, their findings as apart from their recommendations show, was not overlooked by the Select Committee; but for some reason—perhaps through the outside influence mentioned by Sir Fortescue Flannery—they did not act up to their conviction and opinion in this respect, which was not combining justice with intelligence. The point as to the effect of their extraordinary recommendation on the credit of gas undertakings, and through that upon the consumers of gas, was one of the features of the noteworthy speech made by the Rt. Hon. Sir Daniel Ford Goddard, M.P., at the meeting of the Tottenham Light, Heat, and Power Company last Saturday. "Good credit is the essence of "business. . . . As capital becomes dearer, so the "charge upon the consumer becomes greater." We are glad that at the Tottenham meeting, the work of Sir Daniel Goddard in the House of Commons in obtaining the modification of the vital recommendation of the Select Committee was acknowledged, in the name of the proprietors, by Mr. William Cash, F.C.A., who himself deserves recognition for the heavy work of investigation which was represented by his evidence in the witness chair at the inquiry by the Select Committee.

Uncertainties, and an Unfortunate Half Year.

In these much disturbed and changeful times, which for industry and commerce are subject, in increasing degree, to all the ills that the keenest conception could possibly picture, it is easy to defy gas administrators to make sure estimates of their financial needs. If it is not one thing that upsets anticipation, it is another, and generally more than one. It seems inevitable that something fresh shall almost immediately happen in relation to coal or labour, or transit, or gas consumption restrictions, or secondary products trading. Perhaps change for the worse may arise in respect of them all in a single half year for which the price of gas has already been fixed. The past half year has been particularly unfortunate in this respect. It was only last autumn that the contract price of coal was raised (and that retrospectively) by 2s. 6d. per ton. The past half year has witnessed two further advances in the price of coal; labour costs have made a big stride onwards; for many gas undertakings there have been new transport troubles; the coal redistribution scheme has brought inferior coal to some at an enhanced cost; the restrictions as to gas consumption have upset calculations (fortunately for some, in view of the shrinkage of coal deliveries); and secondary products have not been quite so productive, partly in view of the reduced consumption of coal, and partly owing to the falling-off in the demand for coke. It has, in truth, been an unfortunate half year for all gas undertakings; and the combination of troubles has found expression in announcements of the need for more revenue from gas consumers—for, with all the tributaries of revenue of a gas undertaking, it is, through Government action, about the only flexible means of increasing it, though to the detriment of dividend in the case of sliding-scale companies and of those maximum price companies who have reached their zenith in charge.

This leads to the reflection that the inconstancy of factors already experienced is not going to be lightened by (when recourse is had to its protection) the Act which is to permit, upon an Order being made, an undertaking hard hit by the war to pay three-quarters of its standard or maximum dividend, or of the average of the three pre-war years, whichever may be the lower. The fixed dividend, in short, will introduce into pre-calculation another complication, though, in the circumstances, complaint will not be made of this. With all the shifting conditions behind, for those administrations of concerns without good reserves, it will be no certain task to estimate the price that will have to be charged for gas to produce the requisite sum to pay the dividend. Share and stock holders will look for the minimum dividend; but if there are interventions in regard to coal, labour, transport, bye-products, or gas restrictions, which interfere with the production of a sufficiency of revenue, the precious little piece of legislation that provides for the minimum dividend makes no provision for securing the money from some other source. If there is nothing in reserve, the bankers will have to be appealed to; and the estimates of the next increase in the price of gas will have to include something to meet the deficit. We are sadly afraid costs have not finished their upward course, nor, as a result, have charges for gas. The gas industry can neither help the one nor the other; and the Government are not easy to move in regard to their payments for the secondary products they require, or their control over the others.

The uncertainties are well illustrated by the report and accounts which are to be presented to-morrow to the proprietors of the South Metropolitan Gas Company. Anyone could see, from a study of former accounts only, that the Directors' last increase of 6d. in the price of gas did not allow a margin of working; and the financial result before us is the proof. Good management in these days is nothing more than fortunate speculation, based (by the exercise of the best faculties) on known and probable conditions. But the best faculties cannot foresee and provide for such unexpected occurrences as were experienced last half year. The consequence of the speculation of the Directors of the Company upon known and probable conditions is that they have to draw from reserve £23,303 to pay the small dividend at the rate of £3 4s. p.ct. per annum, compared with 5½ p.ct. before the war, although the price of gas in the half year was 3s. 7d., as against 2s. 2d. before the war, and 2s. 8d. in the corresponding period of last year. To-day the price is 4s.; and it is inevitable it must be higher still at Michaelmas. To what extent the Directors cannot possibly determine until they have before them the aggregate of happenings at a period nearer the end of the current quarter. The Company's coal stock position was not at June 30 so satisfactory as we should have liked to see it; the Employees' Committee have now determined that the famous 12½ p.ct. must be added to wages, as it has become so general; the movements of labour continue erratic; and the Coal Controller has got into the unwholesome habit of springing surprises upon large coal users. Uncertainty hems in on every side; day by day things bear a different aspect from yesterday; and the generosity extended by the Government to coal, shipping, and railways has its opposite in the treatment accorded to the gas industry. The sliding-scale was intended to fine the holders of gas capital for bad management, and to reward them for good. War costs have nothing whatever to do with management, good or bad. But Parliament uses them as a flagellant for the innocent holders of gas capital, by allowing them as a minimum only a part of the standard dividend, which was purposely pitched low to induce effort to higher gain, which should simultaneously benefit consumers. Good management cannot alter the cost fixtures of the Government. In short, the whole mechanism of the sliding-scale has been put out of working order by the war and the Government; but the decree has gone forth that gas proprietors shall, notwithstanding, only receive three-quarters of their standard dividend! For the current half year the stockholders of the South Metropolitan Company can only be paid 2½ p.ct.—less than one-half their dividend when results depended on management, and not on Government control, and excessive generosity by the Government to other industries and labour generally. For the past half year, the dividend (already mentioned) is only £3 4s. p.ct. In the net revenue account before us, there is the comparatively small balance of £88,704 available for dividend. The reserve fund is to pay the rest. Before the war the dividend required £175,750. The small dividend just referred to needs £105,758; and it has not been earned with a 3s. 7d. charge. Under the new legislation, it is impossible to hold out any hope of the proprietors receiving after this half year more than 3 p.ct. while war conditions continue.

Just a few figures from the Company's accounts, to show the changes compared with the corresponding half of 1917. Coal cost £996,616, or £121,127 more, though the quantity carbonized was down to 603,420 tons, or 18,931 tons less. Secondary products yielded £544,278, or £10,107 less; so that the net cost of coal was £452,338, as against £321,104, or £131,234 more. Owing to a smaller quantity of coal being carbonized, the output of secondary products was lower; and the demand for coke was not so good. The only item under residuals showing an improvement is tar and tar products; all others exhibit reductions. While mentioning coal, it is noticed that there was an enormous falling-off in the quantity received during the half year—only 411,989 tons, compared with 798,530 tons in the June half of 1917. The amount in store on June 30 was down to 69,605 tons, as against 310,530 tons a year ago—a difference of 240,925 tons. This is not a healthy position; but the explanation is no doubt entirely one of transport. From the coal car-

bonized 11,942 c.ft. of gas was made per ton, compared with 12,498 c.ft.—a reduction no doubt unavoidable, but in the circumstances a pity. It will be interesting to hear just how much the Chairman (Mr. Charles Carpenter, D.Sc.) attributes to gas rationing the heavy decline in the consumption of gas. The quantity sold was 6,863,847,000 c.ft.—a reduction of 617,133,000 c.ft., no less than 599,840,000 c.ft. of which was due to the lessened demand through private meters. But for the gas 3s. 7d. was charged—11d. more than in the first half of 1917. The total gas receipts were £1,165,008, or an increase of £188,194. On the expenditure side of the account, it is seen that manufacture of gas was responsible for a total outlay of £1,357,320, or an increase of £260,171. There are several changes in other items; but we will not specifically notice them. "Co-Partnership" is a blank—in the accounts; not among the men. On the other hand, the total payments in wages in the half year required £511,169, or an increase on the first half of 1917 of £128,404. The result of the Company's working during the half year was a total income of £1,831,573, or £153,359 more; the total expenditure was £1,687,718, or £181,728 more. So £143,854 was sent to net revenue account, or £28,370 less. Nothing more than these salient facts need be drawn from the accounts to show the enormous weight that is being imposed by the war upon Directors and officials, which makes their responsibilities so much the greater, and the days for them so much the more strenuous.

Seeking Coal Economy among the Industries.

The Coal Controller is taking in hand some really practical work; and good should result, if he is not led away by misrepresentation. But it should be more difficult to mislead the Sir Guy Calthrop of 1918, than it was the Mr. Guy Calthrop who temporarily quitted railway management some time ago to help the Government in the matter of coal. He knows now more than then of how coal is put to the most lucrative use for the country by being carbonized; he knows now (as was seen in our editorial columns and "Electricity Supply "Memoranda" last week) that electricity is in its production very wasteful of coal, and that the electrical process is very low down in the thermal efficiency scale, which is the aspect that matters with the Coal Controller; he knows now that, given the means of simply adapting steam-boilers, coke can be used and coal saved; and he knows, too, that in many industries there is scope for saving bituminous coal from prodigal use. Aware of all these things, it is not such an easy matter to deceive the Coal Controller to-day—not that we accuse any of his technical advisers of having practised deception upon him, though not all technical advisers are like the wife of a certain old-world potentate, "above sus- "picion." For example, no one attempts, with the figures before him as published last week, to justify the benevolence of the Coal Controller in allowing electricity stations using more than 2·8 lbs. of coal per kw.-hour, to supply to householders 800 units of electricity for every ton of coal displaced from the domestic hearth.

However, the practical piece of work Sir Guy has taken up is a coal-economy campaign in industries of all kinds—the electricity industry among the others—with the object of reducing fuel consumption in all directions. The industries and factories of the country should welcome with open arms the investigators and teachers of the gospel of economy sent out by the Coal Controller; for anything that reduces works' costs is something that in these or any other times should not be rejected. The plan is in a forward state. The Coal Controller is fond of plotting-out the country into areas; and this is the initial line he has taken for this campaign. It is the right course; for like industries are largely gregarious within geographical limits, and the fuel methods of different industries vary. The idea is to teach the industries how to save fuel—thus benefiting the Coal Controller in his work and themselves. For this purpose, through the assistance of the Coal Control Department's technical staff, a large number of engineers (some 400 will soon be at work) in the Provinces are being enrolled—all voluntary workers—for making inspections of plant and giving advice. Quantity and quality of the coal consumed, together with the efficiency obtained, will be carefully scrutinized; and the causes of results below the standard provided by good working will be investigated. Those manufacturers who are anxious to (if possible) effect economies at once are invited to communicate with the Coal Controller's headquarters. There ought to be a good many such; for we see complaints from several industries of shortage in their supplies of coal, and consequently of short-time working. If the Coal Controller's honorary emissaries can show how to make less fuel do more work, the manufacturers should be permanently grateful. So will those who must use coal, but have other good fuels for disposal.

If any confirmation is needed that there is scope for a considerable saving in connection with steam-boiler plants, it can be obtained from an article that has recently appeared in our contemporary "Engineering" from the pen of Mr. David Brownlie, B.Sc., F.C.S. The author has subjected some 250 steam-boiler plants to complete scientific investigation—this representing about eight years' continuous work. Mr. Brownlie deduces from the results that the average net working efficiency of steam-boiler plants is 60 p.ct. on a total coal consumption for steam generation of 75 to 100 million tons per annum, and that by adopting scientific methods boiler plants can be run on 75 p.ct. efficiency, representing a national saving of coal of no less than 15 to 20 million tons per annum, or 20 p.ct. In the present coal crisis, which is certain to become worse by next winter, the importance of this question can hardly be overrated. The asserted possible saving is almost startling in its magnitude.

The Pound of Flesh under War Conditions.

The Brighton Recorder (Mr. W. P. G. Boxall, K.C.) has restored justice on commonsense grounds in connection with the difference that had arisen between the Brighton Corporation and the Gas Company, as to whether the latter should be convicted for not supplying gas of the standard calorific value when, under the accumulated difficulties of war time, the maintenance of the standard would have jeopardized the continuity of supply. The Corporation apparently preferred the supply of full standard gas, and then the inconvenience for the whole of busy Brighton last winter of a cessation of the supply; and the Justices who convicted the Company manifestly agreed with the Corporation, who are competitors of the Company with electricity. In this latter capacity, the Corporation would no doubt have seen commercial advantage in the failure of the gas supply, and trading advertisement in a conviction for a transgression of statutory condition, even though unavoidable. The judicial mind of the Recorder saw the position in a different light from the Corporation and the Justices; and the words he used in his judgment, as well as the quashing of the conviction itself, are a strong condemnation of the action of the Corporation in not taking a more enlightened view of the conditions under which the Company were working. The Corporation would have done much better to have added the weight of their influence and power to the efforts made by the Company to obtain deliveries of coal and oil. But they had an opportunity for taking another course; and unfortunately for them they took it, by refusing to interpret the functions of local government in a wider sense than prosecution in the event of an offence, in such times as these, against statutory enactment. The Corporation would to-day have found themselves in a more dignified position had they upon investigation found that there was some ground for the representations of the Company, and then exerted themselves to try, in the interests of the town, to improve the Company's weakened and perilous position. But local governors though they be, this was none of their business. The Company unaided had to do, and did, their utmost, and took an intelligent course. The Corporation prosecuted the Company, and called to their aid Mr. W. R. Herring, reinforced on the occasion of the appeal by Mr. Isaac Carr. But there was not the slightest proof forthcoming that the Company were wrong in the statement of their conditions; there was not the slightest proof that they had not done their best. The good luck of one undertaking in getting supplies cannot be taken as proof that there has been any lack of management or deficiency of effort on the part of another company—in these times when there is a deficiency of transport facilities, both on land and sea. If one concern is more fortunate than another in these days, the good fortune may be at the expense of others. It is hard to repress a smile at the extremes of argument and incompatible illustration that sometimes have to be used in the attempt to get a conviction. and then to maintain it on appeal. However, the Brighton Company won, and were allowed their costs on the appeal, although making no claim for the costs below. The Corporation asked for what they considered was their pound of flesh; in the event, they have lost one.

The Householders' Fuel-Rationing Maze.

The print that is being sent round to householders, purporting to give them what they must know to keep themselves safely within the confines of the Fuel and Rationing Order, is a most forbidding document. It has officialism glaring at one from every part. Not only is this so in the appearance of the document, but in the manner in which the information is presented. There are four closely printed pages of lumpy matter; and every line means a restriction, an instruction, or else an obligation to do something or other. We can see those who are not gifted with any high standard of intelligence trying to grapple with this digest and explanatory form; we can hear the busy business man trying hard to absorb what he may or may not do, and with feelings not the most amicable towards Sir Guy Calthrop. Quantities total and proportionate in coal, coke, gas, and electricity, time limitations, "F.H.F." forms, requisitions and certificates, fuel overseers, coal merchants, gas and electricity undertakings, and all the et ceteras of this remarkable piece of construction in control will turn the hair of many householders grey. The information given in the document does not complete what there is to learn. There are also instructions as to procedure printed on the "F.H.F." forms. For every new delivery of coal, there is to be a declaration as to the amount in stock. How the householder is to measure or weigh this up will be a puzzle. He is to be left to his own devices in this respect. There are fortunately certain specified minimum quantities which, if not going to be exceeded, will not require anything more than registration with a licensed coal merchant or a licensed coal dealer. But poor people who purchase coal only as needed have no knowledge of their total annual consumption. The fact of the matter is that in every town a huge building had better be taken, presided over by the Fuel Overseer, in which a large staff is established to instruct and help the nine-tenths of the householders who will be unable unaided to comply with the instructions. The Coal Controller may flatter himself that at one fell swoop he has created more consternation and trouble in the country than the Food Controller has done with all his rationing.

Gas and the Old and New Rationing Orders.

For the purpose the Coal Controller has in view, it seems that after all there was something to be said for the old Rationing Order, though not from the point of view of the Ministry of Munitions. Considerable reductions of private gas consumption are being shown by the gas accounts that are coming in, notably in those of the South Metropolitan, South Suburban, and Tottenham Companies. Mr. Charles Hunt, in his address at the South Suburban meeting, stated that the reduction of the consumption of the Company's ordinary consumers during the three months that the "one-sixth" Order was in operation was no less than 14·1 p.ct. By the new Order, he thinks the small consumers are well cared for, and do not require much sympathy; while the large gas consumers will be very seriously injured. That is to be regretted exceedingly. The reduction of consumption in the aggregate will be a very serious thing indeed for the output of materials required by the Ministry of Munitions; and another serious aspect of the position is that the Coal Controller is not putting to the best use the available plant that can yield the maximum advantage to the country in heat units from the coal employed. These huge reductions in consumption mean a large amount of idle gas-works plant, which in gas and coke puts on to the fuel market upwards of two-thirds of the 30 million or so heat units of the original coal, besides urgently required liquid products, ammonia, and sulphur. On the other hand, the average production of heat units per ton of coal used by the electricity stations of the country (taking the Coal Controller's own figures) is only about 2 million B.Th.U.! The Coal Controller is missing his opportunity of serving the country well by not utilizing gas-works plant up to its maximum capacity.

Cost per 1000 C.Ft. of the Rationing Scheme.

We do not know how he did it; but Sir Daniel F. Goddard has been making a calculation so as to see what the Rationing Order is likely to mean to the Tottenham Light, Heat, and Power Company per 1000 c.ft. of gas sold. He regards the new Order as "rationing gone mad;" and he doubts whether the scheme will be found workable. It is much like a large untried piece of machinery of crude design, about the running of which nobody knows anything. Anyway it means that less gas will be sold; and this will result in the cost of gas being increased. Standing charges will remain. Clerks and staff must be kept whether output is large or small. In the case of Tottenham, it is calculated that this will mean an additional cost upon the gas that is consumed of 2¾d. per 1000 cubic feet. We shall not be surprised, because, though the foundations for the calculation cannot be very well defined before the event, it is easy to see how efficiency and economy in every department will be knocked on the head by the greatly reduced business.

German Scientists and "Abominable Malpractices."

It may be that this paragraph will by some means or other reach the eyes of the scientific men associated with the German gas industry. We do not suppose they are wholly cognizant of all the exalted barbarism and brutal murdering proclivities of their Prussian masters and underlings, which have been capped by the sinking of hospital ships and the aerial bombing of hospitals, containing wounded men and their medical attendants and nurses. But information leaks even through the well-guarded frontiers of a country dominated by educated and crafty savages; and so there is no doubt in our minds that German scientists are not altogether innocent of knowledge of these things, though they have not protested against them. It will, therefore, interest them to know the views of the Royal Society as to their passive conduct. The views are expressed in the following resolution, submitted at a special meeting of the Society by Sir George Beilby, seconded by Dr. M. O. Forster, and duly adopted by the members present: "That, in view of the war having continued during four years without any indication that the scientific men of Germany are unsympathetic towards the abominable malpractices of their Government and their fellow-countrymen, and having regard to the representative character of the Royal Society among British scientific bodies, as recognized by the patronage of His Majesty the King, the Council forthwith take the steps necessary for removing enemy aliens from foreign membership of the Society." We are pleased to be able to assist in the circulation abroad of this resolution.

The Petroleum Technologists' Committee's Report.

The Committee appointed by the Institution of Petroleum Technologists to inquire into the production of oil from cannel coal and allied material is undoubtedly a strong one, as will be seen by their report which we reproduce elsewhere. But the report, which is an interim one, appears to us to be altogether as vague as that issued by the Petroleum Research Department and which was laid at rest, on the ground of in these times impracticability and insufficiency of valid information, by Lord Crewe's Committee, whose report was given last week. The report of the Committee appointed by the Institution of Petroleum Technologists may accompany that of the Petroleum Research Department—anyway for the present—and for the same reasons. It states that the Committee are satisfied that 10,000 tons per day of suitable retorting material—cannel and kindred material—are available. The Petroleum Research Committee's thoughts ran a little higher. Lord Crewe's Committee (as seen last week) absolutely deny the accuracy of such computations. The Petroleum Technologists' Committee also have their eyes on low-temperature carbonization. We suggest that parts of their report should be read in conjunction with that of Lord Crewe's Committee; for it is no use whatever proposing things that are impracticable in the circumstances of the times. We see that the technical advisers of the Committee have examined various forms of retorts, and have had submitted to them many suggestions by inventors and others which hold out considerable promise. But then we go on to read that, as the materials to be treated vary widely in natural characteristics and in their behaviour within the retort, it is apparent that no one type of retort—we take it low-temperature working is referred to all through, as high-temperature operation is not mentioned—can treat to the best advantage all classes of material. But despite this assertion, we get the contradictory ones that there is, however, reason to believe that certain retorts which have been under consideration will treat either caking or non-caking bituminous mineral so as to give a satisfactory throughput; and that there are in existence retorts which will successfully

recover the maximum oil content. The report lacks definiteness, but not vagueness and impracticability. As to other matters in it, comment was made in the "JOURNAL" last week [p. 248].

Housing Schemes.

There is good reason for the gas industry to keep on the track of these. No fewer than 900 authorities have intimated their willingness to build after the war; and they are so gratified with the promise of the Government to assist them with the extra costs due to the war that some of them have intimated their willingness to build a greater number of houses than first specified. There has been a certain amount of criticism of the financial proposals by prominent members of the two Houses of Parliament, but not against general principles. The critics consider the extra cost should be regarded by the Government as a war charge which should be borne by the Exchequer; but they are against a Government subsidy from the public funds in aid of rents. As it is probable that something will fall upon the rates in connection with the scheme, gas undertakings (which will have to bear their share of any deficit) should look well after any business in their line that may be going. It has been finally decided to pass into law a Bill to deal with the whole scheme.

PERSONAL.

Mr. P. O'BRIEN, the Gas Manager at Ballybay, co. Monaghan, has been appointed Gas Manager at Navan, co. Meath.

It will be seen from the report of the proceedings at the annual meeting of the Malta and Mediterranean Gas Company, Ltd., which appears on another page of this issue, that, after 35 years' service, Mr. J. W. STARKEY has retired from the position of General Manager. Mr. A. E. BUCKLEY now fills this office, in addition to that of Engineer, to which he was appointed over a year ago. There have also been some other changes among the Company's staff.

To the previous distinctions conferred upon Captain J. LENNOX STEWART, M.C., M.B., R.A.M.C. (the only son of Mr. James Stewart, the Editor of the "Gas World"), it is a pleasure to record that there has been added the award of the D.S.O. The "Gazette" says that, "although his aid post was in the open, a few yards behind the front line, he remained there, caring for the wounded, and through his efforts they were all dressed and evacuated. He was the only medical officer of the brigade left."

From 63 candidates, Mr. R. ROBERTSON, Superintendent of the Canons' Marsh Gas-Works, Bristol, has been appointed Chief Engineer to the Bristol Gas Company, in succession to Mr. D. Irving, M.Inst. C.E., whose retirement was announced a few weeks ago. Mr. Robertson was trained as a mechanical engineer, and has had 15½ years' workshop and drawing office experience with various manufacturing and consulting firms. His technical training included two years at the Glasgow and West of Scotland Technical College, where he gained the Macquorn-Rankine Gold Medal. He holds First Class Honours Certificates in "Gas Manufacture" and "Gas Supply," and was Bronze Medallist in the latter subject in 1910, in addition to many successes in kindred subjects. In 1905 he was appointed Chief Draughtsman to the Bristol Gas Company, and since 1907 has held the position of Superintendent of the Canons' Marsh works, during which period he has been closely associated with many schemes of reconstruction and development. He is a member of the Institution of Gas Engineers and of the Society of Chemical Industry. Mr. O. J. PRESTON, the Superintendent of the Stapleton Gas-Works, Bristol, has been appointed Deputy-Engineer.

On Friday last a presentation to Mr. T. N. GODDEN, Superintendent of the Linacre Gas-Works, was made at the offices of the Liverpool Gas Company, on his retirement after fifty years' service. In view of Mr. Godden's long connection with the Company, the proceedings were of special interest. He entered the service of the Company as a boy in the office at Athol Street Gas-Works, and worked his way up to the responsible position which he is now vacating. For many years he was Superintendent of the Wavertree works. On the death of Mr. E. Allen, jun., in 1916, he was promoted to the superintendency of the Linacre works—the largest station of the Company. The presentation, which took the form of a silver fruit dish, was made by the Engineer (Mr. Ralph E. Gibson) on behalf of the leading officials of the Engineer's staff. Reference was made by the Engineer and by Messrs. M. C. Telfer (Street Department), G. Haynes (Athol Street), and J. Charnley (Wavertree) to Mr. Godden's long and faithful service, and to his unfailing courtesy, methodical habits, and other good qualities. The recipient suitably responded. A presentation to Mr. Godden has also taken place at the Linacre works, on behalf of the employees there. He thus bears away with him the good will and best wishes of all who were brought into close contact with him. In consequence of the retirement of Mr. Godden, a rearrangement of the staff became necessary. The Linacre works have, for the time being, been placed under the special supervision of Mr. E. ASTBURY, the Assistant Engineer, and Mr. S. CARTER has been transferred from the Garston works to become Acting Superintendent of the Linacre works. Mr. W. FLETCHER has been transferred from the Caryl Street works to become Superintendent at Garston; and Mr. F. E. M. TOOLEY, Assistant Superintendent at Linacre, has been appointed Superintendent of the Caryl Street works.

OBITUARY.

Mr. WALTER E. CAWTHRA, a Signaller in the West Riding Regiment, and formerly on the clerical staff of the Huddersfield Corporation Gas-Works Department, is reported to have been killed in action.

While condoling with a neighbour upon the death of a relative, Mr. JOHN WILLAN, of Spennymoor, aged 70, suddenly became ill, and died within a few minutes. He was a Magistrate, and sat on the County Bench the day before his death. Mr. Willan was actively concerned in gas administration; being Chairman of the Spennymoor Gas Company, and for many years a Director of the City of Durham Gas Company.

DEMOBILIZATION COMMITTEE FOR THE GAS INDUSTRY.

THE Chairman of the Demobilization Committee of the Institution of Gas Engineers, Mr. R. G. Shadbolt, desires us to remind readers of the existence and the purpose of the "Demobilization Committee"—viz., to assist officers and men returning from service with His Majesty's Forces to take up the positions vacated by them within the gas industry on joining H.M. Forces, so far as may be necessary and practicable; and where impracticable, to render whatever assistance lies in their power to enable such persons to obtain equivalent employment in the industry.

To this end, it will facilitate matters if those at present engaged with H.M. Forces, or their representatives who are in any uncertainty as to their pre-war positions being available on demobilization or discharge, will furnish the Committee *in advance*, with full particulars of their case, so that the same may be filed for reference and guidance whenever assistance may be called for.

The "JOURNAL" as also the other organs of the Technical Press have already offered to give the necessary publicity to cases where a fresh post is necessary, on the advice of the Committee; but unless the Committee are in possession of the requisite information, their assistance will be delayed and circumscribed.

Communications in this connection should be addressed either to the Chairman of the Committee, Mr. R. G. Shadbolt, Gas-Works, Grantham, or to the Secretary of the Institution, Mr. Walter T. Dunn, No. 39, Victoria Street, Westminster, S.W. 1.

SUPPLEMENTARY NOTIFICATION OF THE METROPOLITAN GAS REFEREES.

The Minimum of 450 B.Th.U. Gas.

THE following supplementary Notification was issued last week by the Metropolitan Gas Referees—Prof. C. Vernon Boys, Mr. W. J. A. Butterfield, and Dr. J. S. Haldane.

The Minister of Munitions, in the exercise of the powers conferred upon him by Regulation 8G of the Defence of the Realm Regulations, and of all other powers enabling him, has made an Order dated June 28, 1918, as to the manufacture and production of gas, compliance with which by the gas company will protect the company from any forfeiture for failing to comply with its statutory obligations with regard to the illuminating power or the calorific value of the gas supplied by it, provided that in any event gas of a lower calorific power than 450 B.Th.U. gross is not supplied to the consumers.

The effect of the Order being, therefore, to modify the statutory requirements in respect of the illuminating power of the gas supplied by the South Metropolitan Gas Company and the Commercial Gas Company, and in respect of the calorific value of the gas supplied by the Gas Light and Coke Company, the Gas Referees prescribe that:

In testing-places for the South Metropolitan Gas Company, and for the Commercial Gas Company, the Gas Examiner shall make a testing of calorific power; and if the result of this testing shows that the calorific power of the gas at the time is not lower than 450 B.Th.U. gross, he shall be at liberty to omit making the prescribed testings for the day for illuminating power.

In testing-places for the Gas Light and Coke Company, the Gas Examiner shall regard 450 B.Th.U. as substituted for 499·5 (540 less 7·5 p.ct.) B.Th.U., in the wording of section 4 (1), of the Gas Light and Coke Company's Act, 1914, and shall give notice to the Company and make a second testing only in the event of the calorific power being on the first testing ascertained to be below 450 B.Th.U. gross per cubic foot.

FINANCES OF CORPORATION GAS UNDERTAKINGS IN SCOTLAND.

Amendment to the Burghs Gas Supply (Scotland) Act, 1876.

[Communicated.]

The legislation recently effected whereby gas undertakings are now able to increase the statutory maximum charge for gas in order to maintain a three-fourths dividend compared with that of pre-war time, does not meet the cases of corporation gas undertakings in Scotland conducted under the Burghs Gas Supply (Scotland) Act, 1876.

Under this Act, town councils may borrow on their gas rates and charges. The guarantee rate leviable under the Act, however, cannot be used for repayment of capital sums borrowed, but only for interest. Section 27 of the Act makes it lawful to borrow money necessary for the purchase or erection of gas-works, and to grant mortgages of any rates or charges leviable in security of the payment of the money so borrowed and interest thereon. Section 38 of the Act allows town councils to fix, impose, and levy such a rate—to be termed the "Gas Contingent Guarantee Rate"—as may be required to pay any annuities and any interest due thereon, and the interest of money borrowed or to be borrowed. The guarantee rate is the real ultimate security for the money borrowed. This rate, however, can only be imposed to pay annuities and interest thereon, and interest on money borrowed; it cannot be used for the repayment of capital. Many of the Scottish gas undertakings have borrowed the money required for the purchase or extension of their gas-works over a long period; and these corporations have consequently no trouble. In many cases town councils have borrowed capital in small sums locally for fixed periods of three, five, or seven years. As these loans fall due difficulty has been experienced in renewing them, owing to the superior attraction of War Loans; and the difficulty is aggravated by the weakness of the security offered by town councils. What a lender wants is security that the principal sum will be repaid, as well as the interest thereon.

Another weakness of the Act is that no power is given to borrow temporarily for working capital or any similar purpose. The power to borrow from the bank contained in section 30 of the Act is restricted to money required for the purchase or erection of the gas-works. It is therefore sought to amend section 49 of the Burgh Police (Scotland) Act, 1903, so as to give town councils, as gas commissioners, the same power as they already have in every other capacity.

The amending Bill, it is proposed, should include the two following clauses; and as the need for this amendment of the law will not cease with the war, the clauses should be permanent in their operation.

Proposed Clauses.

Power to Borrow on Security of Guarantee Rate.—Notwithstanding anything contained in the Burghs Gas Supply (Scotland) Act, 1876, it shall be lawful for the commissioners, as defined in section 3 of said Act, to grant for money borrowed for the purposes of section 27 thereof, mortgages of the Gas Contingent Guarantee Rate, leviable under section 38 thereof, in security of the principal sums of the money so borrowed, as well as the interest thereon.

Power to Borrow Temporarily.—In section 49 of the Burghs Police (Scotland) Act, 1903, the words "town council" shall include commissioners under the Burghs Gas Supply (Scotland) Act, 1876.

The amendment Bill has passed through Committee, and been read the third time.

Volumetric Tests on Scientific Glassware.—The Metrology Department of the National Physical Laboratory, Teddington, have published their promised pamphlet giving details as to the volumetric tests on scientific glassware which are now undertaken by them. The general conditions and methods of test are set out, with the tolerances allowed and the fees charged.

Failure of the Hamburg Natural Gas Supply.—The natural gas wells at Neuengamme, near Hamburg, after showing failing pressure for some time past, have now ceased to yield gas. There is thus brought to a close a source of wealth to Hamburg which has lasted for some years, and has yielded a net income of £100,000 per annum. It has been specially valuable to the city since the outbreak of war, as a means of supplementing the coal-gas supply and nullifying the effects of coal scarcity in Hamburg.

Gas-Main under a Harbour.—For supplying the Bethlehem Shipbuilding Corporation's Alameda plant with gas for riveting, it was necessary for the Pacific Gas and Electric Company to lay a special main across tbe harbour, the bottom of which is about 30 ft. below average low tide. A trench was dredged 10 ft. deeper than this, into which the pipe-line sank, allowing the wash of the tide to partly cover it after it was laid. The pipe-line was made solid; the joints being welded. To keep water out of the pipe, the inside was made absolutely dry at the start, and the outside was waterproofed with three coverings of tar and paper. At the lowest part of the line, near the centre, a small tank was put, into which the pipe was tapped. The tank was then connected with the shore by a small pipe running through the main pipe. Force pumps keep the catch basin free from condensation. The Alameda works will use 500,000 c.ft. of gas per day.

ELECTRICITY SUPPLY MEMORANDA.

The weather will not allow us to get any great distance from the short gloomy days of winter time; for rain and overcast skies are not conducive to summery thoughts. Probably this is why the Coal Controller has been flooding the country with literature on the subject of the Fuel and Lighting Rationing Order, with the view to enlighten householders as to what they should do, and what they may expect (though in this purpose he has failed in a magnificent way); probably, too, it is why Sir Guy has set moving the wheels of his fuel economy campaign among manufacturers; and probably, too, why he has called upon the Chief Commissioner of Police to aid and abet his plans for reducing fuel consumption in connection with public lighting. It is this last-named matter which is worth a note here; and the other questions may be considered by the Editor to be worth mention in an earlier part of this issue. The Chief Commissioner of Police is willing to help if he can; but he is a wary customer. He is desirous of assisting so long as any reduction of public lighting does not affect the efficiency of his own department. We think he was right to guard himself all round when he sent a communication to the Metropolitan Borough Councils stating that, with the view of securing further economy in the consumption of coal, competent authorities have agreed that street lighting in Inner London may be reduced to 50 p.ct. of the pre-war lighting, provided that the reduction is spread equally over both main and side streets. There is something in uniformity of lighting; but the 50 p.ct. is extremely interesting. Thoughts run from Fleet Street to certain areas of London where for a long time past there has been nothing like 50 p.ct. of the pre-war illumination in the roadways. But it would not mean any increase of fuel consumption to get a 50 p.ct. pre-war illumination allowance. It would only mean the proper distribution of the light by an intelligent treatment of the lanterns or globes with which the lights are encased. To get a reduction of the fuel consumed for public lighting, it will be necessary to look to the internal arrangements at the lamp heads; and this means money, labour, and appliances which are not at hand. For instance, take the electric arc lamps. They have during wartime been using as much current as hitherto, and have required as much labour. Every item of cost has been greater; and reduction of light has depended solely on the degree of obscuration of the globes. The only way to secure fuel economy with such lamps is to do as the Westminster City Council are proposing to do, by arrangement with the Charing Cross (West-End and City) Electric Supply Company—that is, replace the arc lamps by 100-watt incandescent lamps of the gas-filled (the so-called "half-watt") type. Of course, local conditions, too, make the 50 p.ct. reduction impossible if equality of lighting is to be obtained. For instance, the Lambeth Borough Council have decided that it would be inadvisable to reduce the street lighting in the inner part of the borough to more than 30 p.ct. of the pre-war lighting, owing to the wide spacing of the lamps and the density of the population; but in the outer area it is intended that every effort is to be made in order to reduce the lighting by at least 50 p.ct.

Public Lighting and Coal Consumption.

Safety First.

As remarked, the Chief Commissioner of Police, while desiring to help the Coal Controller, does not want thereby to increase the troubles of his own department. It is now quite a hoary saying that a public lamp is as good as a policeman; and so the Chief Commissioner makes it clear that the reduced lighting must be subject to revision should it lead to any increase of crime or danger to traffic, or seriously handicap the supervision of the streets by the police. It would never do to enhance facilities for criminals, or to endanger life to a greater extent, in order to save coal; and we have no able-bodied men to spare to put on the streets to compensate for any reduction of the protection that even the present measure of war time lighting affords. The Commissioner makes the further reservation that, at the end of the summer, he may have to reconsider the position. Meanwhile, in regard to uniformity of lighting effects, the military authorities attach particular importance to this; and therefore it may be necessary, from their point of view, to treat high-power lamps specially, and to increase lighting in places where the prevailing conditions demand this course. Thus it will be seen that the Military Authorities, the Commissioner of Police, and the Coal Controller are all independently interested in this matter of street lighting. It is, however, evident that the Military Authorities and the Commissioner of Police can work well together; for the military do not pay heed now so much to the degree of lighting providing there is uniformity, and the police have no objection to uniformity providing there is sufficiency. We are afraid that the Coal Controller must be the last person to be considered, save where economy can be effected by the supersession of high-power lamps by lower-power ones, with an intelligent treatment of the lanterns and globes of the lamps. The Military Authorities' object in asking for uniform lighting is to prevent, by differences in the intensity of the illumination, the communication of information to Germany's aerial murderers on their air-craft expeditions as to important and less important thoroughfares and places that they may happen to visit.

The Better Way.

"Electrical Industries" calls attention to the fact that in America they do some things better than in this country. We give plenty of scope for this in certain directions; and our American friends return the compliment in other directions. They are great on organization in the United States, and do not altogether admire our bureaucratic system, with its autocratic powers, and its prolific output of forms, regulations, &c. Our contemporary speaks with marked approval of the work done by the National Committee on Gas and Electric Service in the States—this body being constituted of representatives of gas undertakings and central electricity stations. The Committee have been rendering yeoman service to the Government in equipping camps, munition works, and shipyards, and in helping to co-ordinate the supply of coal and machinery, so that public utility concerns might maintain their output for national purposes. The information compiled as to the quantities of coal needed for gas and electricity supply has helped largely to avoid serious shortage. And this is not the sum of the good service rendered by this Committee of skilled, practical, and business men; and yet the United States have not been in the war so long as this country.

A Protective Organization for Electrical Engineers.

A great deal of hostility was shown among electrical men to the proposal of the Council of the Institution of Electrical Engineers to amalgamate into one organization the various electrical engineering bodies, in order to establish a strong combined Association for the protection of the interests of electrical engineers. This is the Association of British Electrical Engineers which was alluded to in the "Memoranda" for July 16. The hostility to the scheme was not because the objects were not considered good, but because there was a feeling that the Council of the Institution were, in making this move, doing something to extinguish organizations already in existence which were doing work very much akin to that which the Institution were proposing should be taken up by the new body. The antagonistic ones seemed to see in the scheme motives good and bad—the bad being the one just referred to; the good the strong organization which should be a power in the electrical land in connection with subjects political and protective. For instance, in the matter of the Whitley report, it is to have a definite and strong organization through which electrical engineers can exert their influence, can think and act collectively, and can by co-operative effort improve their position. The result of the hostile feeling is that the scheme has undergone revision, and now it is gaining ground. The revision came about at a conference that was held, on the invitation of the Institution of Electrical Engineers, at which were some delegates from the Associated Municipal Electrical Engineers in Greater London, the Chief Technical Assistants' Association, as well as the Electrical Power Engineers' Association, which is a comparatively young but robust body. At the conference, various resolutions were passed, subject to ratification by the Councils of the various bodies. One of these agrees to the formation of a combined Protective Association for the whole of the electric supply industry. Another is that chief engineers be included in the membership, provided they are not employers or employers' representatives on an industrial council or similar body dealing with technical staffs; subject also to proper safeguards for special staff questions that may arise. It was also agreed to adopt the constitution and (for the present) the title of the Electrical Power Engineers' Association, seeing that it is the only existing Association for the purposes in view which is constituted as a trade union. The qualification for membership is to be that of the Electrical Power Engineers' Association; but all new members elected after Dec. 31, 1921, will be required to have passed the Assoc.M.Inst.E.E. examination or an equivalent examination. All's well that ends well.

A Big Scheme at Birmingham.

The municipalities of the country are doing their utmost to get in their own big schemes of electric generating plant before the gargantuan project of national electricity generation can possibly be planned and put into execution. If this sort of thing is allowed, what the ultimate position of the new municipal works will be in relation to the final scheme, is a bit doubtful. There is, for example, the Birmingham scheme, which plans the construction of a gigantic power station at Nechells, the total cost of which will be £1,338,710, of which £58,260 has already been spent. When war broke out, the work had been started. But there was no chance of the Corporation completing it; and so temporary measures were taken to meet the urgent requirements of the city. From time to time attempts have been made to get the Government authorities to allow the work to proceed. But the matter has been deferred; and the position remains the same, until now the Electric Supply Committee can see nothing but pressing necessity for carrying out the work. Meantime, the Government authorities have been considering whether a large power station could not be constructed for the supply of Birmingham and the area of the Shropshire, Worcestershire, and Staffordshire Electric Power Company. But the Corporation and the Power Company have views of their own. The latter have proposed a scheme for the construction of a separate station at Smethwick; and this has led to the idea of linking-up. Conditional on the Corporation providing a linking-up main, authority has now been given to them to proceed with the Nechells scheme, so that surplus current may be exchanged between the two stations on terms to be arranged. Stations of this kind are not insignificant items; and the wonder of outside observers is whether they will comfortably fit in with the national scheme of reformation.

Government Assistance.

Then there is the material increase in the cost of almost every item of the expenditure for the Nechells scheme; and, in the aggregate, this will be no small sum. It would not have been so great if the work had been continued at the time the war broke out. The Birmingham Electric Supply Committee think that the Government should help to meet this extra cost; and negotiations are proceeding to this end. We do not quite understand whether this means that the country generally should be saddled with these extra costs. But, if so, the idea is a piece of impertinence of a kind that is taking deep root among some men in the electricity industry. No other industry is receiving help from the Government owing to the higher cost of materials and labour; and no other industry has shown equal audacity in asking for the help. The Government will not give the gas industry even a decent price for the products required for war purposes, nor a respectable dividend on its capital. In our individual capacities, no one seems inclined to pay the extra costs that material and labour demand of us as part of the price of living in these times. Electricity suppliers, however, appear to think that they have exceptional claims. In the Departmental Committees' reports, claim to Government financial assistance has been conspicuous—this no doubt being the work of the electrical champions on the Committees. Nothing has been advanced by them in vindication of undue preference; and no explanation has been vouchsafed as to why people who will directly benefit from the new conditions as to electricity supply should do so at the expense of people who will not do so. If, too, the schemes do not work out with satisfactory results, then there will be a further raid upon the pockets of the community to make up deficits—all with the vague notion of benefiting the electricity industry and supplying manufacturers with power at a cheaper rate than the overall cost. We cannot see that the idea is founded on equity; and the electrical men do not claim that it is. They think it sufficient to argue that they are conferring a benefit upon industry, and that in doing this the country generally will reap advantage. Business men like guarantees of a more substantial kind.

Davis's Drying Ovens.

Gas-heated drying ovens of various types, suitable for core drying, japanning, enamelling, armature drying, &c., form the subject of a circular newly issued by the Davis Furnace Company, of Luton. These stoves are supplied in double-cased and treble-cased type, and are suitable for any operations that can be carried out at temperatures up to 500° Fahr. The heating is by natural draught burners, for consuming gas at ordinary main pressure; but, where necessary, the burner arrangement can be modified for working upon producer gas. A table is included of standard sizes (with current prices), which can be delivered promptly; and, in addition, there are full particulars of net and gross weights and measurements, with cost of export packing and delivery f.o.b.

National Kitchen Equipment.

Information on the best and most economical way of fitting-up national kitchens is opportune; and it is to be found in convenient form in a Special National Kitchen Number (First Series) of "A Thousand-and-One Uses for Gas," which has been prepared by the British Commercial Gas Association. There are photographs of actual kitchens, with plans, as well as a diagram illustrative of a model scheme designed by the Architect to the National Kitchens Division, as an example to local authorities. The last-named is accompanied by a table giving the number of appliances required for cooking 1000 portions or 2500 portions. The kitchens dealt with in the article are, of course, provided with gas apparatus—this fuel being shown to be the most suitable for the purpose in view. The figures quoted throughout the article will satisfy readers as to the soundness of the claims that the first cost of installation is very moderate, because the appliances are simple in construction and economical of material and labour, and that the maintenance charges are reduced to a minimum, because with proper care and attention there is really nothing in a gas cooking appliance to get out of order. As an example of the latter point, mention is made of the fact that at the National Training School of Cookery some gas appliances which were installed forty years ago are still in use and thoroughly efficient, though they have required nothing but minor and quite inexpensive adjustments during this time.

It is stated that the mixture known in France as "E.H.A." is, in principle, allied to the South African fuels, of which "Natalite" is typical, consisting esentially of alcohol and ether, with or without the addition of benzol or some other spirit. In the French mixture, the ether only amounts to about 10 p.ct., and benzol, or an alternative, to 25 p.ct. In "Natalite" a higher percentage of ether is employed.

BLUE WATER GAS AND COAL ECONOMY (?).

By "Cricket."

One of the chief considerations of the day is whether the making of an increased percentage of blue water gas is really performing any national economy in coal at all. The writer is convinced it is not. Moreover, if the undermentioned hypothetical case is followed in its stages, it will be concluded that the case is one that is applicable in practice at the present moment.

An engineering firm some years ago decided that the best interests in coal economy could be served by erecting their own gas-works and supplying themselves with gas for heating, lighting, and power, and with coke and breeze for steam-power generation. They also laid down water-gas plant to overcome the difficulties of sudden rushes of work. At the outbreak of war, the firm placed themselves at the disposal of the Government, and were entirely turned-over to the making of shells and shell parts—in fact, they became a most essential war works, and maintained a steady weekly output. The bye-products of coal distillation not required are sold. The gas-works themselves are used to the best advantage, and come into line with other gas-works in regard to recovering from the coal carbonized the raw material for the dozens of essential war materials, the long list of which has appeared again and again in the pages of the "Journal."

Stage I.

Having a steady weekly output of shells, it was not necessary to work the water-gas plant, especially as at the time no difficulty was experienced in obtaining the necessary coal. The coal and resultant products used for power purposes, &c., were disposed of as follows:

Coal Carbonized.	Gas Necessary for Use at Works.	Coke and Breeze Used for Steam Power Generator.	Total Coal Used.
100 tons. . .	1,200,000 of 500 B.Th.U.	57½ tons	100 tons

Stage II.

In course of time it was found so difficult to procure coal that under the advice of the authorities, the firm were advised that only 50 tons of coal per week would be allowed the gas-works, and the remainder of the gas required must be blue water gas made out of coke and breeze. The output of munitions was to be maintained at all costs. The manager, realizing that the large percentage of blue gas to be made would very considerably weaken the quality of the gas—in fact, bring down the quality from 500 to 375 B.Th.U., and therefore he would have to use proportionately more to turn out the same number of shells, and that he would not have enough coke and breeze for steam raising—made urgent request for coal as a supplement, pointing out that otherwise the output of munitions must suffer. The coal required for steam-raising had to be allowed, and it was found that the coal supplied about equalled the steam-raising power of the coke and breeze.

Coal Carbonized.	Gas Used.	Coal Used or Steam Power.	Total Coal Used.
50 tons	600,000 of 500 B.Th.U.	53 tons 15 cwt.	103 tons 15 cwt.
Coke and Breeze used for Water Gas Manufacture.		Coke and Breeze Used for Steam Power.	
25 tons	1,000,000 of 300 B.Th.U.	3 tons 15 cwt.	
	1,600,000 of 375 B.Th.U.		
Equal to	1,200,000 of 500 B.Th.U.		

NOTE.—Total coal used equals 3¾ p.ct. more than at Stage I.

Stage III.

After a few weeks' working and making the usual returns as to recovery of fertilizers, tar, toluol, &c., the authorities concerned pointed out to the manager the serious diminution of bye-products, and asked if out of the less coal carbonized he would do his best to extract a larger quantity per ton. The manager replied that, as he was bound to turn out a regular quantity of shells per week, the higher extraction of toluol, &c., would result in his having to use more fuel at the water-gas plant, because the diminished quality of the coal gas, due to a higher extraction of toluol, would cause a higher percentage of water-gas to be made, and there would be less coke and breeze for the steam generating plant. Consequently he would need more coal to burn under the steam-boilers.

The coal authorities had also written to say that they were gratified to see from the manager's returns that the total fuel of all kinds now used was considerably less than formerly—in fact, he was now only using 132½ tons of fuel of all kinds, as against 157½ tons formerly. They were pleased at the economy in fuel. This made the manager smile. He pointed out that their process of reasoning was at fault—coke and breeze were only residuals from coal distillation, and, when available, displaced coal. The real factor for the department to study was the total coal used. They would now observe from the returns that he was using 3¾ p.ct. more coal than formerly; and if this was the case at other gas-works, the wastage in coal must be considerable, as well as transport and labour. He also pointed out that other Government Departments had drawn his attention to the serious diminution of essential war materials from coal distillation, and suggested that the departments concerned should confer together.

The coal authorities admitted that the manager's process of reasoning was the correct one in regard to coal economy, and that, after consulting the other departments, it was decided that he should be allowed to increase the half of his original quantity of coal carbonized to three-quarters. They would be glad to have a report on the matter after a few weeks' trial.

Acting on the arrangements made, and carbonizing 75 p.ct. of his former quantity per week, the result was as follows:

Coal Carbonized.	Gas Used.	Coal Used at Steam Plant.	Total Coal Used.
75 tons	900,000 of 500 B.Th.U.	26 tons 17½ cwt.	101 tons 17½ cwt.
Coke and Breeze for Water Gas.		Coal and Breeze Used at Steam Plant.	
12 tons 10 cwt. .	500,000 of 300 B.Th.U.	30 tons 12½ cwt.	
	1,400,000 of 428 B.Th.U.		
Equal to	1,200,000 of 500 B.Th.U.		

NOTE.—Total coal used equals nearly 2 p.ct. more than at Stage I.

Stage IV.

The manager duly reported that conditions were more comfortable; but considering he was only burning the coal used at the steam-power plant, and losing all the valuable war residuals from it so urgently required, he considered he could make a saving in coal of nearly 2 p.ct. if he was allowed to transfer the coal used at the steam-power plant to the gas-works. He pointed out that if all gas-works could make a saving of 2 p.ct., it would result in a yearly economy of about 300,000 tons of coal. He thought the matter at the present crisis was worth serious attention.

Stage V.

In reply, the authorities thanked the manager, and considered he had better return to his original working (Stage I.). They thought, however, that, owing to the absence of miners, transport, and other difficulties, it would be impossible to procure the usual variety of gas coal, but that the quantity would be made up by diverting household coal which was available owing to the operations of the Household Fuel and Lighting Order. They would be glad to hear what was the largest percentage of household coal he could deal with. The manager replied that he had consulted some friends who had carbonized house coals; and, profiting by their experience, and owing to the high volatile qualities and low ash content of household coal, he was prepared, by slightly altering his methods of working, to take as much as 50 p.ct. of good household coal. Further, he considered, by the methods he would use, it would result in considerable economy in coal carbonized.

The manager, finding out from his friends that household coal formed a better coke for steam raising but that used in the retort-setting furnaces the smaller and more friable state of the coke did not allow sufficient aëration to produce as high a heat as the larger and harder coke from the gas coals, decided to use in the retort-furnaces only the coke from the gas coal, and employ the household coke with better advantage than the gas coke at the steam-power plant. He considered, as the usual gas coal had a volatile content of about 28 p.ct., and the household coke about 35 p.ct., that by this more scientific method of carbonizing he must get an average make of 13,500 c.ft. per ton, as against 12,000 c.ft. per ton. The result of working 50 p.ct. household coal and 50 p.ct. gas coal was as follows:

Coal Carbonized.	Gas Used.	Coal Used at Steam Power Plant.	Total Coal Used.
88 tons.	1,200,000 c.ft. of 500 B.Th.U.	6 tons 18 cwt.	94 tons 18 cwt.
		Coke and Breeze Used at Steam Power Plant.	
		50 tons 12 cwt.	

NOTE.—Total coal used equals a saving of over 5 p.ct. on Stage I.

Stage VI.

The manager reported to the authorities that the trial of 50 p.ct. household coal and 50 p.ct. gas coal had resulted not only in the considerable saving of over 5 p.ct. on his former use of 100 p.ct. gas coal—and if it could be worked at all gas-works would result in an economy of about 700,000 tons per annum—but that he was able to easily get his former quantitative results in total extraction, the tar was of better quality and gave less trouble, and, moreover, the amount of ammonia for fertilizers, &c., had considerably increased per ton of coal carbonized. From his experience there was no doubt that when gas of lower quality than was formerly

supplied to the public directly, proportionately more gas must be consumed to obtain the same results. He considered that if public gas concerns were allowed to make 100 p.ct. coal gas it would be eminently more serviceable to the State and its allies—considering that the coal required, explosives, fertilizers, dyes, fuel oil for the navies, &c., would all be increased in quantities for their general protection and for the earlier end of the war.

Stage VII.

A co-ordinated committee of the departments concerned are considering the matter.

The above hypothetical case is, as a matter of fact, a thoroughly practical one when considered in the light of a single town supplied by one gas-works, of which there are many cases. The coke, coke breeze, and gas are certainly supplied for essential uses to concerns outside the gas-works; but, all the same, where coke and breeze are taken from these concerns by its use for water-gas manufacture, it has to be supplanted with raw coal, which is burnt and not distilled to recover all the vitally necessary war materials, without which the war cannot possibly be won. The case, of course, applies to every gas-works. The present loss of the vital bye-products and waste of coal, as is shown in the above case, are so considerable that it is to be hoped the several Government Departments concerned will form a Committee, and, after hearing the evidence of practical gas people, take the only sensible course open—that is to say, provide gas-works with the best varieties of coal to produce, by scientific working, the highest results per ton of coal, and eliminate as far as is possible the manufacture of water gas. The great general desire is for us to win the war as soon as ever possible; and British coal used in the truest economical way can be made the principal means of more quickly ending the war.

DETERMINATION OF FREE CARBON IN TAR.

By "W. G."

The methods advocated in most of the text-books depend on the weighing of a portion of tar into a filter cone; but these methods are quite inaccurate and wrong in principle. As soon as the tar comes on to the filter-paper, it begins to soak through. Provided that the filter-paper is thick enough, it will not have penetrated, perhaps, till it has been fitted into the extractor; but even in this case, on the addition of the extracting liquid, some of the tar is driven through, before having come into contact with an excess of the reagent. In these circumstances, the free carbon is precipitated outside the filter-paper, and can in fact be seen in the collecting flask. It is no use thickening the filter-paper; for as Ab-der-Halden has pointed out, the free carbon is so finely disseminated through tar as to completely pass through filter-paper; and it is not coagulated until treated with an excess of benzene or some similar liquid.

The method recommended by the authority quoted above has been found entirely satisfactory. In this, about five or more grams of the tar are weighed-out into a conical flask, and gently warmed under a reflux condenser for two hours with about 200 cc. of toluene. The separated carbon is then filtered-off through a tared filter-paper, and washed successively with hot toluene and hot alcohol till the runnings are quite clean. The filter-paper and carbon are then dried, at 100° C., and weighed.

British Scientific Products Exhibition.—Readers who are in London will find interest in this exhibition, which is being held at King's College, Strand, and will be open daily from 12 noon to 8 p.m. Further information will be given next week.

Purification of Gas by Electricity.—According to the "Elektrotechnische Rundschau," satisfactory results have attended the removal of tar and other impurities from coal gas by means of electricity. High-tension direct current is discharged between a cage made of thin wires and a tube; the system of wires being mounted in the middle of the tube. The gas is cleaned in its passage through the tube. It is essential to prevent access of air to the precipitation chamber, in order to avoid the danger of explosion. It was found that the tendency towards the production of harmful discharges is least if the wire electrode is negative. The shape of the electrode is very important; and the sustaining insulators are specially formed and cemented into the tube. A ½-in. gas-tube is passed through a series of cast-iron discs between which the thin wires are fixed. The whole arrangement is then placed in a felt-covered tube, which constitutes the earthed electrode. The apparatus was tested with a flow of 7500 cb.m. of gas per hour—two precipitation chambers being used. Discs of the active electrode were covered with 16 thin piano-steel wires. The passage traversed by the gas was about 4 m. long; and the gas was exposed to the discharge for about 0·4 second. After five hours' operation, the tar deposited on the insulators was found to interfere with the action. For complete cleansing of the gas, 0·2 kw.-hour was required for 7500 c.m. The test was made with 20,000 volts, and a current of about 3 milliampères. The temperature of the coal gas had little influence on the operation. Naphthalene can be secured by a second electric precipitation.

FUEL ECONOMY CAMPAIGN.

Owing to the large number of miners called to the Colours, and the great need of coal for our Allies, the various Government Departments, and industrial undertakings, the Controller of Coal Mines has instituted a coal economy campaign, with the object of reducing fuel consumption in every direction possible.

The Controller is being assisted by a technical staff attached to the head office; and arrangements have now been made for a large number of engineers in the Provinces to attach themselves to the Coal Control Department for this special purpose. This arrangement enables the country to be mapped-out in districts, so that all industrial consumers will within a reasonable time be in touch with the organization.

The scheme comprises two main sections—(1) Electrical undertakings; and (2) industrial undertakings. The work involved includes the careful scrutiny of the quantity and quality of coal consumed by the various undertakings and the efficiency obtained. It also includes the inspection of factories and works by experts, in order to ascertain means by which fuel consumption may be reduced, and the best methods to this end. A very considerable amount of work in connection with the campaign has already been done; but it is intended to accelerate the rate of progress as much as circumstances will admit. Some 400 skilled engineers will shortly be at work in various parts of the British Isles; and these gentlemen are giving their services to the Government without salary.

Any public body or company or person wishing to effect economies at once, and desiring the Controller's assistance in this direction, is invited to communicate with Coal Control Headquarters, Room No. 309, Holborn Viaduct Hotel, London, E.C. 1, when arrangements will be made to send a technical expert to look into the conditions under which coal is being consumed, and to co-operate with the consumer in effecting economy. Apart from special applications of this kind, the Controller's representatives will visit firms in turn in accordance with a general plan of operations.

So imperative is the need to reduce coal consumption to a minimum, that a rationing scheme for all industrial undertakings will be introduced shortly.

CENTENARY AT KIDDERMINSTER.

In keeping with the town with which it is connected, the Kidderminster gas undertaking has been a progressive one; and with the arrival of last June, it was possible to look back upon a hundred years of good work done. To commemorate their centenary, the Company have collected and had printed in pamphlet form information which, in a concise way, sets forth the history of the works, and shows how early Kidderminster was in the field in securing for its inhabitants so important an addition to the comforts of life as a good supply of gas.

So far as the gas supply of the town is concerned, the first reference is to "King's Treatise on Coal Gas," where it is stated that "early in 1817, Clegg, after having ably carried out the duties devolving upon him, retired from the service of the Chartered Gas Company, to erect gas-works to supply Birmingham, Bristol, Chester, Kidderminster, Worcester, and other places." The first meeting of the Company was held on June 16, 1818, when Lord Beauchamp and the Hon. Colonel Lygon were thanked for their assistance in passing the Bill through the House. In 1836, consumers burning gas by meter were notified of a reduction in price from 15s. to 10s. per 1000 c.ft.; and, after some fluctuation, in 1862 the charge ranged from 5s. 6d. to 5s., according to consumption, less 10 p.ct. on all accounts over £10. Various other reductions followed, until in 1895 figures of 2s. 6d. and 2s. 4d., for consumptions under and over 50,000 c.ft. respectively, were reached.

Many of the items recorded are of a personal nature. From them, it is gathered that the present Chairman (Mr. G. W. Grosvenor) was elected in 1902. In 1873, Mr. C. Grant was appointed Secretary, and held the position until his death in 1911. It is recorded that "he was a faithful servant; and his services were ever appreciated by the Directors and the public." The present Consulting Engineer and Secretary is Mr. A. Dougall. The appointment of the Engineer and Manager (Mr. Percy Dougall) dates from 1913.

Deposits of monazite sand, with a content of cerium up to 23 p.ct., are stated to exist in the Nizhi Tagel district of Russia. It is proposed to send the sand to Petrograd for the extraction of the rare metals.

It is intended by the Canadian Council for Scientific and Industrial Research to manufacture carbonized lignite briquettes. A plant, costing about £80,000, will be constructed near Estevan, Saskatchewan. The proposal is to take 2 tons of poor lignite with about 32 p.ct. of moisture and 7300 B.Th.U. per pound, and turn them into 1 ton of briquettes containing 5 p.ct. of moisture, and having a fuel value of 12,000 B.Th.U. Sulphite liquor will be used as the binder. The fuel is smokeless and odourless.

PRODUCTION OF OIL FROM CANNEL COAL AND ALLIED MINERALS.

Report to the Institution of Petroleum Technologists.

Reference was made in last week's "JOURNAL" to the interim report to the Council of the Institution of Petroleum Technologists of the Committee appointed "to obtain evidence in respect of the quantity of cannel coal and allied minerals available in Great Britain as a source of motor spirit, fuel oil, and other products, and to formulate a scheme for the utilization of such supplies." We are now able to give the names of the members of the Committee and the full text of their report, dated July 24.

The Committee consisted of:

Captain R. W. Barnett, M.P., *Chairman*. Rear-Admiral Sir Edmond J. W. Slade, K.C.S.I., K.C.V.O., *Vice-Chairman*. The Lord Glenconner; Edmund W. Abram, Esq.; Sir Ralph P. Ashton; Prof. J. S. S. Brame; W. J. A. Butterfield, Esq.; Major David Davies, M.P.; Arthur W. Eastlake, Esq.; Chas. Greenway, Esq.; Admiral of the Fleet, The Hon. Sir Hedworth Meux, G.C.B., M.P.; W. G. Phillips, Esq.; W. Rogers, Esq. (*Hon. Treasurer*); Chas. Steel, Esq.; A. E. M. Taylor, Esq; Capt. H. FitzHerbert Wright, M.P.

TECHNICAL ADVISERS.

Geological—E. H. Cunningham-Craig, Esq.
Mineral and Supplies—J. Arthur Greene, Esq.
Retorting—Dr. F. Mollwo Perkin.
Chemical—Dr. A. E. Dunstan; A. G. V. Berry, Esq.

INTERIM REPORT TO THE COUNCIL OF THE INSTITUTION OF PETROLEUM TECHNOLOGISTS.

1.—On our appointment by you at the end of February last as a Committee for the purposes specified in the terms of reference, we commenced our proceedings by appointing from our Committee four Sub-Committees as follows:

"*A*." *Supplies of Material:* 1.—Quality of material. 2.—Quantity of material. 3.—Grouping of collieries for assembling material with a minimum of transport. 4.—Methods by which the maximum of retortable material can be obtained.

"*B*." *Treatment of Material:* 1.—Retorting, forms of retorts, &c. 2.—Bye-products, including residues. 3.—Refining of oil.

"*C*." *Costs:* 1.—Cost of raw material, including extra labour in mining and handling. 2.—Cost of retorting plant, erection and working. 3.—Cost of refining oil. 4.—Bye-products costs.

"*D*." *Financial Scheme:* 1.—Wages. 2.—Royalties. 3.—Value of products. 4.—Drafting of scheme.

2.—The possibility of obtaining oil in quantity from low-temperature distillation of cannel coal and its cognates has been considered from two points of view—namely,

(1) As an immediate war measure, having in view the production of motor spirit and fuel oil for the services.
(2) As a permanent commercial undertaking and a measure of reconstruction.

3.—Sufficient evidence having been obtained from colliery proprietors and others to justify the conclusion that a very large amount of retortable material can be obtained for the production of oil in Great Britain, the Committee have decided to issue this interim report.

4.—The raw material in sight divides itself into three classes:

(*a*) Non-caking material with a high yield of oil giving a residue of low value as household and steam-raising fuel, but of considerable value for producer gas and other purposes.
(*b*) Caking and non-caking material with a smaller yield of oil than (*a*), but affording a residue of great value for domestic and industrial fuel.
(*c*) Material of a variety intermediate between (*a*) and (*b*).

5.—As a result of tests carried out by various processes, it has been established that a yield of between 15 and 80 gallons of crude oil per ton can be obtained from material existing in the British Isles. This crude oil can be refined to give at least 8 p.ct. of spirit and 40 to 50 p.ct. of fuel oil.

6.—The Committee are satisfied that at least 10,000 tons per day of retortable material could be economically assembled for treatment provided the necessary facilities were given by the Government and the requisite labour were available. At an average of 30 gallons of oil per ton, this would yield 300,000 gallons of crude oil a day, or upwards of 400,000 tons a year.

7.—Much of this material has hitherto been mined but not raised, or, if raised, has been thrown upon the spoil heaps or returned to the underground workings. If the substitution of the shovel for the fork, so strongly demanded by the miners, were made obligatory by Government Order, still more material would be sent up and wasted. If, however, the recommendations of this Committee be adopted and retorts erected, the increased supply of material will be utilized, and the colliery owner be enabled to pay the miner for the extra tonnage brought to bank.

8.—The development of the industry as a permanent commercial undertaking depends upon the utilization of the bye-products and residues.

9.—The efficient utilization by means of low-temperature distillation of the heat energy of the raw materials employed will make available valuable constituents which now go to waste, and thus tend to relieve the shortage of fuel for domestic and industrial purposes.

10.—(*a*) The residues obtained from caking material will provide a considerable supply of clean fuel without smoke, and of high calorific value.

(*b*) The residues obtained from a non-caking material, high in ash, can be utilized in a producer for the production of power gas and sulphate of ammonia. The quantity of gas must depend on the relative proportions of carbon and ash in the residue, and, consequently, no generalization as to the yield of gas is possible.

(*c*) The residues obtained from a non-caking coal low in ash can be utilized in the manufacture of briquettes.

11.—It must also be borne in mind that the utilization of the large quantities of residues obtainable from the treatment of non-caking material should greatly facilitate the schemes for generating cheap electrical power which have been the subject of consideration by the Electric Power Supply Committee of the Board of Trade and the Coal Conservation Sub-Committee of the Ministry of Reconstruction.

12.—The Technical Advisers of the Committee have carefully investigated several types of retort, and also have had submitted to them many suggestions by inventors and others which hold forth considerable promise. As the materials to be treated vary widely in natural characteristics and in their behaviour within the retort, it is apparent that no one type of retort can treat to the best advantage all classes of material. There is, however, every reason to believe that certain retorts which have been under consideration will treat either caking or non-caking bituminous mineral so as to give a satisfactory throughput. There are in existence retorts which will successfully recover the maximum oil content.

13.—The Committee have not overlooked the question of the labour which will be required; but they desire to emphasize the fact that the establishment of an industry for the low-temperature distillation of cannel coal and its cognates will afford many openings for the employment of unskilled surface labour.

14.—The Committee regard with apprehension the situation as to the supply of fuel oil and motor spirit, and the long delay in taking action to develop home supplies. They, therefore, strongly urge the adoption of the following

RECOMMENDATIONS.

(1) That the War Cabinet should be invited to lay down a definite policy for the guidance of the Departments as to the relative national value and importance at the present time of oil and coal, the provision of the necessary labour, raw materials, and transport.
(2) That the Government should afford all necessary facilities to those who are prepared to find the capital, and take the risk, for the erection at suitable centres of plant for the treatment on a commercial basis of the material known to exist.
(3) That an experimental station be established forthwith, so that retorts of any design provisionally approved by the Institution of Petroleum Technologists can be erected and tried out, and material tested with a view to ascertaining its character, oil yield, and residual values.
(4) That such experimental station shall be maintained by, and at the expense of, the Government; or, alternatively,
(5) That the Government shall afford all necessary and reasonable facilities to the Institution of Petroleum Technologists for the erection of a testing-station of their own.

Coal Screenings and Water-Gas Liquid as Fuel.

Some time ago, when manufacturers first felt the pinch of the coming fuel shortage, says the New York "Gas Age," a manufacturing corporation in Long Island City (N.Y.) submitted to a practical test a new artificial fuel. The experiment proving a success, a patent was taken out. Everywhere in the hard coal fields of the United States there is found an enormous accumulation of culm, or mine screenings; and it was found that using 95 p.ct. of this and 5 p.ct. of the special liquid, a fuel might be obtained of such consistency that it would neither fall through the grate-bars nor go up the chimney under a forced draught. For many months the Corporation have used no other fuel under their boilers, and have obtained a maximum of efficiency with a saving of nearly 50 p.ct. in expense. A test in the laboratories of the Columbia University gave a calorific value of 13,950 B.Th.U. per pound, or a heating value equal to that of a high grade of anthracite coal. The "special liquid" referred to is a bye-product resulting from the manufacture of carburetted water gas, of which millions of gallons annually are produced in the United States. The composition is fired loose, just like ordinary coal; and it is pointed out that because of the high boiling-point of the liquid, it remains with the screenings, keeping the mass moist, up to the stage at which the carbon in the coal ignites. Once the loose material actually begins to burn, the problem of stability in the fire is solved. The Industrial Fuel Corporation of New York has acquired the sole ownership of the United States patent, and all foreign rights to the fuel.

Clarkson's Coke-Fuel Steam-Motor.—Appreciative reference to the Clarkson steam-driven coke-fuel motor vehicles was, as recorded in the "JOURNAL" at the time, made by Colonel R. E. B. Crompton, C.B., in his Presidential Address to the Commercial Motor Users' Association. The three-ton lorry, in its latest form, he said, was a marvel of simplicity and good engineering design. Those who wish to study in detail these coke-fuel steam-motors as arranged for omnibus work, may be directed to the issue of the "Engineer" for the 2nd inst., wherein will be found a fully-illustrated description of the new type of motor, which is now for the first time published. "The need at the present time," says our contemporary, "of developing new applications of solid fuels is sufficiently obvious; and, of the solid fuels which are available, coke is by far the most abundant, as well as the cheapest under present conditions. The Coal Controller is desirous of encouraging the use of gas coke in every possible way; and from this standpoint the new motor is being introduced at a most opportune time."

IRISH GAS MANAGERS' ASSOCIATION.

ADDRESS BY THE PRESIDENT, Mr. H. KIRKHAM, of New Ross.

[Delivered at Dublin, Tuesday, Aug. 13.]

Our esteemed Secretary, with his usual thoughtfulness, suggested that—in view of the shortage of paper, labour, &c.—it would be desirable that the papers (including the President's address) should be as concise as possible—a suggestion with which I heartily agree. However, although my address will be short, I trust it will be the means of provoking a healthy discussion on the few subjects with which it deals, and which are at the present time engaging considerable attention. Hitherto the President's address has not been regarded as subject to discussion; but, as I have just indicated, my few remarks will be—I think rightly so. A President may or may not represent the feeling of the Association; and I consider it only right that the members should be allowed to give their opinion upon it.

THE IMPORTANCE OF THE GAS INDUSTRY.

Though our industry is one of peace and much benefit to the nation, few I think appreciate the extent to which it has assisted in the successful prosecution of the war, in spite of great difficulties and discouragement from those in authority. How many realize that, but for the assistance given by it, it would have been impossible to carry on the war? This is not my opinion, but that of one who is in such a position that his words cannot be controverted or doubted. I refer to the Director-General of Explosives Supplies in the Ministry of Munitions—the Right Hon. Lord Moulton, P.C., G.B.E., F.R.S.—who has occupied that position since 1914. In his recent Presidential Address to the Institution of Gas Engineers he said:

> Your industry—typically peaceful in character and aim—has furnished material for purely war purposes without which it would have been impossible to maintain the fight. I have thus learnt as well the flexibility and resourcefulness of the industry as the importance to the nation that all its varied capacities should have free scope. Not only have the benzol, toluol, and ammonia produced by it furnished the materials for our high explosives, but in the direction of other needs of very different nature it has given promise of similar usefulness.

These words, coming from such a source, should, in my opinion, give cause for thought to those superficial people who are at times apt to sneer at and try to belittle our industry. At the same time, we should feel proud to be connected with an industry which has been of such service in upholding the stability of the empire.

Not only has our industry been of such service in providing materials for the manufacture of high explosives, but it has also provided heat for annealing shells, cooking and hot water in canteens, the propulsion of vehicles, and other services in war work with which you are no doubt familiar. In addition, the sulphate of ammonia supplied by it has been, and still is, of very great importance to the needs of the agriculturist.

Now one would expect that an industry which has proved itself so important to the State, would be encouraged to still further activities; but this evidently is not the way of thinking of those in authority. No sooner was it practically demonstrated that gas could be used successfully in the propulsion of vehicles which had hitherto used petrol than various restrictions, orders, and regulations were imposed, which have had the effect of stifling progress in this direction. Take sulphate of ammonia—so necessary to agriculture. The price of sulphuric acid used in its manufacture increased in price, and naturally one would expect that the manufacturers of sulphate would be allowed to increase their price in proportion. But, no; sulphate is controlled at such a price as to make its manufacture hardly worth while.

SHORTAGE OF COAL AND GAS RATIONING.

I mentioned a few moments ago how much depended on an ample supply of the materials for the manufacture of high explosives and other important services. Now, in order to keep up the supply, it is necessary that our industry should have its full amount of coal. Instead, we are threatened with a shortage; and directions have been issued by those in authority to economize as much as possible in the use of gas in order to conserve the coal supply.

Now it seems extraordinary that, although we are in danger of a shortage, comparatively large supplies are being shipped to neutral countries. Of course, we shall be told that this is to keep up the exchange, and so on; and I presume it will also keep up the excess profits of shippers.

I maintain that to use gas instead of coal is the most effectual means of economizing coal, besides relieving the strain on the shipping and railways. To reduce the coal supply to the industry will have the opposite effect to that desired. Let me illustrate what I mean in a simple way. A few days ago I took out the amount consumed for the past quarter by six slot consumers who use gas solely for cooking, and with whose circumstances I am familiar—they are not specially selected. The amount used for the quarter is: A, 5250 c.ft.; B, 7750; C, 5450; D, 5450; E, 4950; F, 5650—giving a total of 34,500 c.ft. for thirteen weeks. To manufacture 34,500 c.ft. of gas at 8000 c.ft. sold per ton of coal carbonized would require (say) 4 tons 7 cwt. of coal.

I ascertained that, before using gas solely, the average amount of coal used by each person was 2 cwt. per week. Therefore, for the same period, they would have used $2 \times 6 \times 13 = 156$ cwt., or 7 tons 16 cwt. You will see, therefore, that by using gas there is a saving of coal of 3 tons 9 cwt., and in addition there is left for sale over 35 cwt. of coke, to say nothing of the bye-products which the authorities are so anxious to secure, and which are simply wasted when coal is consumed in the ordinary way in ranges, &c. The figures I give, of 8000 c.ft. of gas and 8 cwt. of coke for sale per ton of coal carbonized are, I know, low in comparison with those of large works. I have taken the figures as, perhaps, near to those which obtain in the majority of small works in this country.

EXTENDED USE OF GAS FOR HEATING.

Now the illustration given is simply an example of what is taking place all over the country to-day. Coal is so scarce and dear that people are turning to gas for cooking, &c., as they never did before. I have never experienced such a demand for gas-rings (of which I had a fair stock); and the invariable reason given for having them fixed is in order to save coal.

According to the "Gas-World Year-Book" for 1918, the gas grillers and cookers in Ireland number 109,641; but no estimate is given of the number of gas-rings (of which there must be an enormous number), fires, gas-engines, and other gas-consuming appliances. Now all these, by employing gas (and therefore using coal to the greatest advantage), are conserving the coal supply to an extent which, I believe, is not appreciated by those in authority. At all events, the position has been placed before them on several occasions by representatives of the Association. Of course, everyone must recognize that the Coal Controller's position is one of much anxiety and heavy responsibity. I feel sure the checking, indexing, tabulating, &c., of the forms we have to return to his office every week must absorb much of his assistant's time. I would, therefore, ask you to send the forms back promptly and filled in correctly, and as full and complete as you can. At the same time, I would like to see two additional columns—one to show the price paid for coal per ton in pre-war time and the other our present prices.

PRESENT COAL PRICES.

You will remember that in the early days of the war we were solemnly assured that the price should not exceed 4s. above that charged in pre-war time. Since then a couple of half-crowns have been tacked on; and, to break the monotony, the last addition was one shilling and sixpence. I have tried the simple method of adding these increases to the pre-war price, and yet I cannot make them tally with present prices. Hence my idea of the additional two columns; so that we could pass it on to the Controller for solution. I am sure he would be pleased to put matters right, or perhaps a shorter way would be for those in authority to issue a form showing the actual increases in price authorized since the year 1913.

Before turning from the all-important question of coal supply, I think that I may safely say that we are all complying with the request of the Coal Controller to impress on our customers the absolute necessity for economy in the use of gas. In my own case, I have done this by sending a circular to each consumer, and in other ways as opportunity offers. With the exception of one lamp, the whole of our public lighting has been dispensed with—including the harbour lighting.

COMMERCIAL SECTIONS.

Last year a discussion took place with reference to the working of Commercial Sections; but so far nothing has come of it. It seems to me that, in addition to helping the Empire to fight for its existence, our industry as a whole will have to devise means to preserve its own. Anything, therefore, which would tend to strengthen our position would be desirable. There is at the present time a good deal of discussion about reconstruction after the war; and this discussion is carried on by those who certainly cannot be accused of having an extraordinary liking for our industry. It would, therefore, be to our interest to be prepared for the reconstruction.

REMUNERATION OF GAS MANAGERS.

During the year the question of the inadequate salaries paid to gas managers cropped-up in several ways. The matter was discussed by the Committee; and it was decided that, with the approval of the member concerned, an application should be made by the Association on his behalf for better treatment. A few did not wish this done, but by far the larger portion did. Whether the applications have had the desired effect, I am not able to say; but, in view of present conditions, I think that the matter should not be allowed to drop.

No doubt some employers treat their managers well, while with others it is the reverse. A general levelling-up seems to be required. You will have observed that for some time past the medical profession has been agitating for improved salaries for certain work; and if it is not beneath the dignity of that profession, I do not see that it should be beneath ours.

GAS UNDERTAKINGS AND THE SUPPLY OF ELECTRICITY.

Some of you are no doubt aware that my Directors have decided to supply electricity in addition to gas; and the necessary legal steps to enable them to do so are practically complete. My Directors consider that they are in a position to undertake the supply under favourable circumstances, and with a reasonable prospect of success. There is no blinking the fact that the use of electricity is spreading; and in my opinion it would be to the

interest of members to keep themselves posted on the matter. After all, we are in business to supply light, heat, and power; and why should we not be in a position to give it to our customers in whichever way they prefer? It is, however, a matter requiring careful consideration, and the pros and cons weighed carefully.

THE DAY'S PROCEEDINGS.

I regret that the number of papers for our meeting is so small. This is caused by two members having, through unforeseen circumstances, been compelled to withdraw. I wish to thank Mr. Reid for so kindly stepping into the breach at very short notice indeed. The paper by Mr. Young, on his methane hydrogen plant, will I feel sure prove very interesting. In these days of anxiety, it is not easy for anyone to settle down to the writing of papers; and I know Mr. Young has had his full share of worry through shortage of coal. In the circumstances, we are very much obliged to him for his trouble.

In conclusion, I wish to take the opportunity of thanking our esteemed Secretary for his invaluable help to me during the year. Circumstances over which I had no control prevented me from carrying out some of my duties; and our Secretary, with that real good fellowship which we appreciate so much, undertook the work for me. I feel, therefore, it is the merest justice that I should express—however inadequately—my very sincere thanks to him for his invariable courtesy and kindness.

Evaporation of Volatile Liquids.

In the "Genie Civil," M. Grebel points out that the enhanced cost of such volatile liquids as petrol, benzol, benzene, &c., has rendered it specially desirable to diminish losses by evaporation. At the works of MM. Bonnet-Spazin at Lyons apparatus has been installed which appears to have solved the problem. It can be applied to existing reservoirs of the vertical cylindrical type, and is inexpensive. For the smaller sizes the apparatus for preventing evaporation consists of a dished metal float made of sheet-iron with a bottom convex to the liquid, and guided by small rollers or balls for the vertical travel. For reservoirs of larger diameters the float is closed and stayed inside, and guided in its travel as in the former case. The general result is that a diminution of 80 p.ct. of the loss has been obtained through decreasing the exposed surface of the liquid by 98 p.ct.

Treating Shale Oil in America.

The "Engineering and Mining Journal" recently gave the results of laboratory tests of Colorado shale. The American Shale Refining Compny, of Denver, Col., have undertaken the production and refining of shale oil on a commercial scale; a retort furnace capable of treating 150 tons of shale per day being in course of erection. The furnace consists of four circular combustion chambers and four retort chambers, arranged alternately—forming a cylinder approximately 30 ft. high and 12 ft. diameter. The crushed shale is fed automatically from two steel tanks on to a revolving table in the top retort chamber. Each retort chamber contains a similar table; and the shale is finally drawn off by screw conveyors at the bottom. The temperature of each combustion chamber can be regulated; and it is estimated that 95 p.ct. of the valuable constituents of the shale can be recovered. The furnace is worked under vacuum; the gases being drawn off by a vacuum pump into water-cooled condensers.

Combined Coal and Water Gas.

In the course of an article in which he advances the view that the gas of the future will be a coal and water gas of about 350 to 400 B.Th.U., Mr. W. D. Wilcox, of Chicago, writing in the "Gas Record," says that about three years ago he conceived the idea that, with the elimination of candle power as a requisite, and a rise in the price of gas oil that made heat units from gas oil substantially more expensive than those obtained from coal, the coming gas would be a coal and water gas combined in about the ratio resulting from a complete gasification of coal. The idea was, however, found to be not entirely new, as apparatus producing such a gas had been tried both in Europe and America with good results as regarded efficiency and gasification, though the method could not compete with the continuously operated producer in the production of cheap fuel gas to be consumed at the point of production, because of the greater degree of attention required in operation. The retort generator produced something good in itself, but for which there was no market. This was some time ago; and Mr. Wilcox submits that the changes in the use of gas and in the economic situation as regards oil entitle this method to serious consideration at the present juncture. One substantial advantage is that it can be operated with a much greater variety of coals than can be used in an ordinary retort or water-gas generator. Coals high in moisture and combined oxygen can be turned into gas of equally good quality, and with the same efficiency, as is possible using gas coal. In communities at a considerable distance from supplies of coking coal, and with freights up, this is, he remarks, a matter of greater importance than in the past. The apparatus has something of the flexibility of a water-gas set; and the gas will be equally suitable for use in domestic and industrial fields.

THE CHEMICAL ENGINEER.

In connection with the report appearing in last week's issue [p. 254] of a meeting at which definite proposals were made for the development of chemical engineering, it will be of interest to reproduce some remarks on the subject made by Prof. Henry Louis in the course of his Presidential Address to the Society of Chemical Industry.

One of the questions, Prof. Louis said, that have been most prominently before British chemists recently is that of the best means of securing an adequate supply of chemical engineers to maintain and develop the great chemical industries of the country. Many of us realize that our chemical industry may in some respects be said to have been practically stationary during recent years; and in no respect is this fact more noticeable than in the failure to take advantage of modern mechanical methods of handling large bodies of material. In other words, not sufficient has been made of the application of modern engineering methods to chemical industries. The difficulty undoubtedly lies in finding men who are equally conversant with the chemical problems to be solved and the engineering facilities available for their solution; while the problem is further complicated by the fact that the constructional materials employed are frequently required to withstand corrosive influences which lie outside the experience of the ordinary engineer. As has been repeatedly pointed out of late years, a man is required with special training, who is, for convenience sake, usually spoken of as a chemical engineer, though the term is not in all respects a happy one. No doubt the difficulties in meeting this modern demand for a thoroughly trained chemical engineer are considerable. No chemist would admit that a man can be considered to be a qualified technical chemist unless he had spent a reasonable amount of time working in an industrial chemical laboratory. On the other hand, no engineer would consider that a man had received a true engineering training unless he had put in a reasonable time in working in the shops. It is therefore evident that, unless a young man is willing and able to devote an exceptional length of time to his preliminary training, he cannot be thoroughly equipped as a chemical engineer; and the result is almost necessarily a compromise. Hitherto work of this kind has perforce been carried out by men who were either only engineers or else only chemists; and the President would have considerable difficulty in saying which he has found to be the worse—the average chemist's engineering or the average engineer's chemistry. There have, of course, been numerous and brilliant exceptions; and most of the important problems of chemical engineering have been tackled by men who had naturally special aptitude in both directions, so that there has been a large amount of first-class chemical engineering work done, though much of it is scattered through various branches of industry not generally included in what we understand by chemical industry in the ordinary acceptation of the term.

Plant Economies.

The need of the strictest economy in these days of abnormal prices formed the subject of a paper read by Mr. Thomas Rice, at the last meeting of the Iowa Gas Association. He pointed out that, in spite of the demand for coal conservation, quantities were still being wasted through faulty covering and leaky piping. As a rule the main lines of steam-piping were covered, but the small ones were neglected. It was, however, just as important to cover a $\frac{3}{4}$-in steam-pipe as a larger one. At the author's works at Beatrice, there is a plan in operation for utilizing the entire waste heat from one water-gas set. The superheater is tapped on the side near the top, and an 8-in. saddle bolted on. The piping, which is of 8-in. flanged cast iron, is run at an angle of 45° direct to the boiler; connection is made in the side of the fire-box; and a quick-opening valve is used during the blows and runs—being open while blowing, and shut when making gas. The cap on top of the machine is never opened. Since the installation of this device several years ago, no coal has been purchased. Steam can be kept up to the required pressure while running; but there is also used, in connection with the waste gas, the waste clinker from the water-gas set. In other words, after thoroughly sorting out the largest coke, the balance—clinkers and all—is put into the boiler fire-box. In plants where a steam engine or turbine is used on the blower, the author does not believe the waste gas alone can be depended upon; but as he has electrically connected blowers, there is no trouble in getting sufficient steam to meet requirements.

A New Swedish Heat Insulating Material.—According to the "Electrician," a new heat-insulating material is being produced in Sweden, which is said to be very promising. The chief constituent is a kind of fine clay found on the island of Mors. This "molera," as it is termed, is very porous; and each grain appears to be hollow—a fact which is no doubt largely responsible for its good heat-insulating properties. After it has been burnt, the molera becomes extremely light. Before it is burnt it is mixed with cork—bricks of the mixture being burnt, when the cork is consumed. The new insulator is said to be primarily suitable for the lagging of steam pipes and boilers, but may also have uses in other directions.

CORRESPONDENCE.

[*We are not responsible for opinions expressed by Correspondents.*]

Vertical Retorts v. Low-Temperature Carbonization.

SIR,—I desire to draw your attention to the letter of Dr. F. Mollwo Perkin in the "JOURNAL" for July 30 [p. 208], as I find that in your current issue no one else has taken up the matter on behalf of the gas industry.

For fear that silence may be accepted in some quarters as giving consent to the veiled charge made by Dr. Perkin, that the gas industry is only "playing about" with the subject of carbonizing cannel coals in continuous vertical retorts, I wish to repudiate any such suggestion. It is a well-known fact—and one that has already been accepted in the highest quarters—that the various systems of continuous vertical retorts are being so operated as to carbonize all the cannel that can be produced in this country, in the most successful manner for the realization of the greatest value (per ton of cannel treated) in oil and all the other useful products obtained from the scientific carbonization of cannel. While so-called low-temperature products are obtained by this means, the work is done at high-temperature speed, and with very much lower working costs and capital expenditure. These results have been proved to be secured by the use of continuous vertical retorts; whereas there is as yet no proof that any low-temperature process is worth even the cost of the site upon which the plant is erected—let alone the capital charges and the working costs. In no way are the large expenditures of money which the advocates of low-temperature processes desire to bring about justified by the results obtained from such systems.

My contentions in the interests of the gas industry are, I think, fully borne out, and my assertions more than proved, by the recent report of Lord Crewe's Committee on the Production of Fuel Oil from Home Sources.

SAMUEL GLOVER.

St. Helens, Aug. 9, 1918.

Continuous Ovens for Baking Bread.

SIR,—I notice in your issue dated July 30 a short article on "Gas in a Bakery," upon which I should like to comment, if not trespassing too much on your valuable space. The article describes a gas-heated oven erected by the Public Service Gas Company of New Jersey; and while the information given is certainly very interesting, I should not like your readers to think that nothing is being done in the same direction in this country.

I believe you described some time ago in the "JOURNAL" the Baker-Keith gas-heated travelling oven, as arranged for the baking of all classes of biscuits; and a large number of these ovens have been built during the last three years. Gas heating has, however, been very successfully applied to the baking of bread on a travelling plate oven of very much larger dimensions than the one referred to in your article. At the present time, there is in London an oven built on the Baker-Keith system over 60 ft. long on the baking plate and 9 ft. wide, which is regularly baking some 2000 loaves per hour, and working frequently twenty hours per day. The loaves baked are of regular English size, of 2-lb. weight; and if your readers care to make a calculation, they will see that the English oven has a capacity many times that of the American type.

The system of applying the gas to the ovens above referred to differs from the American system, inasmuch as the gas and air are not mixed together until they reach the burners. In this way the amount of air and gas can be perfectly regulated and adjusted at each burner. It is quite true that in a properly-designed gas-heated travelling plate or chain oven the heat does not vary, and exactly the same conditions can be obtained at the end of a day's baking as at the beginning; and this fact has been appreciated by many biscuit manufacturers who have installed the Baker-Keith type of oven. If it had not been for the abnormal conditions now existing, which restrict trade, there would have been quite a number of large gas-heated travelling ovens at work by now for the baking of bread.

I trust the above will enable your readers to appreciate the fact that we are in front of any other country in the application of gas for the baking of bread and biscuits.

H. KIRMAN,
(Messrs. Baker and Sons, Ltd.)

Willesden Junction, N.W., Aug. 10, 1918.

Alloa Corporation Gas Department.—At a meeting of the Gas Committee held on Tuesday last, Provost Pearson presented the financial results of the working of the undertaking for the past year. There was an increased sale of gas equal to 11,500,000 c.ft., yielding a revenue of £19,343 compared with £17,959. Residuals amounted to £7588, compared with £6559. The total income was £27,075. On the expenditure side, there was paid for coal £12,330, for salaries, wages, and maintenance of works £3400. The cost of distribution (being repairs to pipes, meters, and cookers) was £1694. Taxes and insurance amounted to £1190, and, in addition, there was an item of £1226 for income-tax. The total expenditure was £20,234, leaving a gross profit of £6841. The deficit of £945 in the working of the Electricity Department for the year was also met out of profits. The report was considered satisfactory, especially in view of the increase in price of coal and wages as war bonus to workers, which increased from £236 to £970. The estimates for the current year showed a surplus after meeting all charges, including a considerable extra cost for coal due to the recent increase of 4s. per ton by order of the Coal Controller. In view of the satisfactory financial condition of the undertaking, it was agreed to continue the same rates for gas as at present—viz., 2s. 5d. per 1000 c.ft. for lighting, cooking, &c., 2s. 9d. for slot meters, and 1s. 8d. to 2s. 2d. for power and industrial purposes as per scale. These rates show an increase of 4d. per 1000 c.ft. compared with pre-war charges.

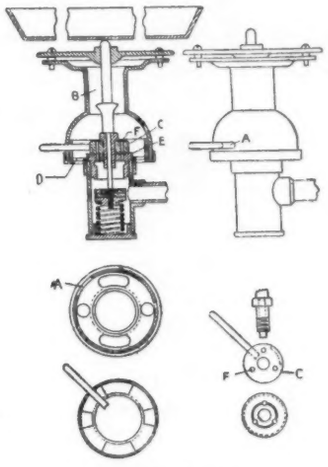
REGISTER OF PATENTS.

Gas-Cooker Burners.—No. 113,260.

WELSENAAR, J. H., of Haarlem, Holland.

No. 9678; July 4, 1917. Convention date, Feb. 8, 1917.

This invention relates to burners for gas cookers wherein the main gas inlet is opened by the weight of the object to be heated and ignition is effected by a bye-pass ignition flame—means being provided for regulating simultaneously the supply of gas and air so as to preserve a desired proportion of gas and air at all times.



Welsenaar's Gas Cooker Burner.

To regulate simultaneously the gas and air inlet, there is a horizontal slit A in the side of the mixing chamber B for passing a handle fixed to the gas regulator C, and which passes also through an opening in the air slide D, so that the slide is also turned round when the gas regulator is moved. To shut the air openings, the slide is provided with openings and wings. Two of the four openings in the bottom of the mixing chamber are larger than the other two, so that when the two small openings are covered by the wings, part of the larger openings is kept free for air passage.

The regulation of the gas is as follows: The nozzle E contains (say) three openings and similarly the turnable gas regulator, resting thereon, has three corresponding openings of equal size. When the handle is turned these openings are made to coincide; and the passage of gas is then fully opened and the flame burns high. But there is a narrow circular groove over the three openings of the nozzle; and when, for burning a low flame, the three openings are closed, a small quantity of gas still passes through the openings F—having passed through the circular groove. A pin secured to the nipple and groove formed in the gas regulator C are arranged so as to limit the stroke of the handle.

Gas Cooking Stoves.—No. 116,609.

SHERWOOD, F., of Birmingham.

No. 12,081; Aug. 23, 1917.

This gas cooking stove comprises an oven space closed at its top, bottom, sides, and back (except for perforations), with an outer casing enclosing the oven and providing around it communicating side spaces and a back space. There are two transversely arranged bunsen burners fitted within the skirting of the outer casing below the oven—one to each side space; and a boiling chamber is provided with heating products from the side spaces, substantially as described. The two bunsen burners are of narrow box-like construction entirely closed except at their feed ends and jet openings. They are combined with injector-like gas supply tubes (one for each burner) carried by a common supply pipe, the fixing position of which is within the open ends of the burners.

Moistening Air in Connection with a Gas-Stove. No. 117,002.

GOVER, H. C., of Norbury.

No. 15,004; Oct. 17, 1917.

This apparatus consists of a receptacle or reservoir for holding a supply of water, in connection with an enclosed box containing a regulating ball-valve, from which box a flexible pipe conveys the supply of water to a vessel (open at the top) to be placed in front of the fire. The parts are so adjusted in relation to each other that the level of the water in the vessel in front of the fire is maintained at the required height. As the water becomes heated, the steam from it "steadily flows from an opening at the top." Thus, "corresponding to the supply of gas, the heat of the fire, and the evaporation of the water, the level of the water in the vessel is maintained at a constant level."

The patentee suggests that the apparatus described, used in connection with an ordinary gas-fire, would evaporate from four to six quarts of water in twelve hours, "completely overcoming the dryness

of the air necessarily arising from the use of a gas-fire, and thereby completely prevent any unhealthy effects."

Gasifying Liquid Hydrocarbons.—No. 116,970.

SOUTHEY, A. W., of Mill Hill, N.W.

No. 12,108; Aug. 23, 1917.

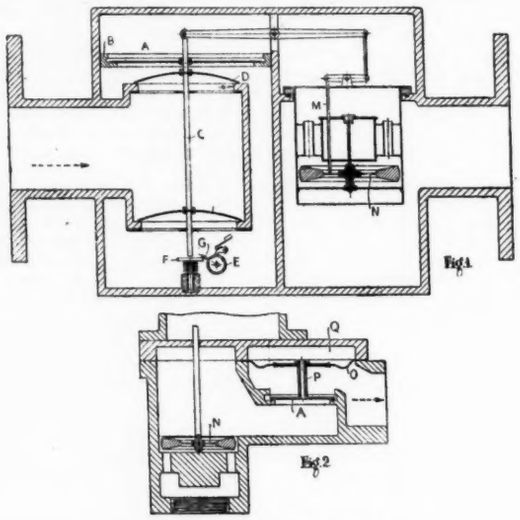
The patentee claims as his invention: 1. Apparatus for gasifying liquid hydrocarbons wherein the hydrocarbon liquid in a condition of subdivision is raised by suction to a gasifying flame in excess of the capacity of the latter for gasification, and wherein the surplus in the form of a liquid column finds its way by gravity back to the liquid supply, against the influence of the vacuum created by the suction. 2. A gasifying chamber, an outlet therefrom for the gasified hydrocarbon, a choke tube of requisite length entering the gasifying chamber and accessible to a gasifying flame, a jet entering the choke tube, and a connection between the gasifying chamber and the liquid supply for the jet arranged so as to return the surplus or ungasified liquid hydrocarbon to the supply.

Proportional or Inferential Gas-Meters.—No. 117,207.

THORP, F. & H. T., of Whitefield, Lancs.

No. 17,074; Nov. 20, 1917. No. 5026; March 21, 1918.

This combined invention, relating to meters of the rotary, proportional, or inferential type, has for its object to provide means for preventing the flow of gas through the meter when the rate of flow falls below a predetermined minimum which is the limit of the accurate registration by the meter of the volume of gas passing through it. Heretofore, the patentees remark, it has been proposed to provide a piston loaded valve for converting a continuous flow of fluid into an intermittent flow through a rotary type meter, so as to prevent the passage of fluid through the meter without registration of its quantity. In accordance with their invention, there is provided a disc-like part which is floatable in the gas-way or passage through the meter when the rate of flow is not below a predetermined minimum—this part being initially moved by external means to permit of the flow, and either itself forming, or being connected to, a gas-control valve for the meter.



Thorp's Proportional or Differential Meter.

Fig. 1 is a sectional elevation through a rotary meter having the improvements applied to it, but with certain parts of the metering mechanism omitted. Fig. 2 shows modification.

The disc-like element A is capable of free movement axially within a passage formed by the ring B through which the gas measured by the meter passes. The area around the disc and between it and the ring B for the travel of the gas is of such a restricted character that when the meter is passing more than the minimum quantity of gas for which it will register satisfactorily, the disc is supported out of the restricted passage by the gas flow. If the rate of flow falls below the minimum, the gas is unable to support the disc and it falls. The disc is connected to the spindle C of an equilibrium valve comprising two discs D serving as a gas control valve for the meter. These parts are so disposed that when the flow of gas through the meter is above the predetermined minimum rate for the size of meter, the disc is raised or floats and holds the valve D open; but when the rate of flow falls below the minimum, the disc ceases to float and causes the closing of the control valve. The initial opening of the valve is effected by externally operated means. In the example shown, the ratchet wheel E is operated from outside the meter casing and depresses a spring pressed element F. When the latter is released by the projection G (rigid with the ratchet wheel), it rises rapidly, and opens the valve D with a trigger-like action. The disc A then maintains the valve open if the flow of gas is above the minimum; otherwise the disc and valve return to their out-of-service positions. The brake M is employed to prevent overrunning of the rotor N of the meter, and when the control valve is closed to allow of the brake engaging the rotor. In fig. 1 the brake M itself is connected to the disc A.

In fig. 2 the disc A is acted upon by the flowing gas, to itself form the control valve and to be connected to a diaphragm O by a hollow stem P, so that the gas from the meter gains access to the outer side Q of the diaphragm, which is of larger area than the disc A, and so holds the latter closed. When, however, the disc A has been opened, the pressure at the inner side of the diaphragm counteracts the pressure at the opposite side (Q), and the velocity of flow of the gas holds the disc A raised unless the velocity falls below the predetermined minimum, when the disc falls and the pressure on the outer side of the diaphragm holds the disc closed upon its seat. The valve A is opened by externally operated means [not shown] as in the previous arrangement.

Manufacture and Treatment of Coal Gas. No. 117,308.

HELPS, GEORGE, of Nuneaton.

No. 10,224; July 14, 1917. No. 12,043; Aug. 22, 1917.

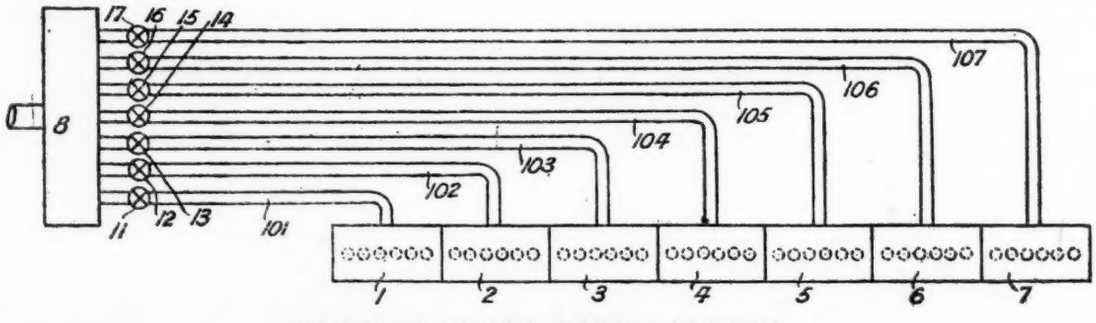
It is well known, the patentee writes in his complete specification of this "combined" invention, that, when coal is carbonized in retorts under pressure, nitrogen and carbon dioxide cannot enter such retorts from the retort-setting, and coal gas has been diluted with blue water gas introduced into horizontal retorts or (at or near) the hydraulic main. Producer gas has also been made in separate producers, and introduced into the retorts or hydraulic mains in small quantities; but in this case hot carbonic dioxide and nitrogen were not, except accidentally, prevented from entering the retort.

According to his invention the process of distilling coal or the like for the manufacture of gas and bye-products is, by arranging (as has before been proposed) that the pressure inside the retort does not fall below that of the hot combustion gases outside the retort so carried out as to make as rich a mixture as the primary materials will conveniently allow, and subsequently to dilute the gas produced. With ordinary coal, an undiluted gas of about 580 B.Th.U. net per cubic foot is made. This undiluted gas so made may be stored in a gasholder, and subsequently diluted in the main by admitting the diluent from a nozzle facing upstream, or preferably from several nozzles all facing upstream. Any suitable diluent (air, producer gas, water gas) may be employed to bring the gas down to a quality of 500 B.Th.U. net per cubic foot or below it—for example, to a gas of a very low quality as described in patent No. 111,495.

A still better yield of straight coal gas is said to be obtained if, besides arranging that the pressure inside the retort does not fall below that of the gases outside the retort, the process is so carried out that there is no greater pressure in a retort while giving off its maximum flow of gas when just charged than there is at a subsequent stage of the distillation when the retort is giving off a very much less quantity of gas. Thus the gas is taken off almost as quickly as it is made; for "it is well known that the hydrocarbons are destroyed if they remain too long in the upper portions of a hot retort." In present practice, it is not "possible to prevent this, as each bed of retorts must receive the same pull whatever may be their stage of the distillation." The result is "that the gas from a retort just charged giving off its maximum volume of gas mixes in the hydraulic main with the gas from another retort giving off its minimum quantity, which is poor in quality and at a much higher temperature."

To effect this, the patentee proposes that all the retorts in a bed are charged at substantially the same time—the gas derived from the several retort-beds being led into a common receiver or main; and he provides means by which the pull on the different beds may be varied to suit the volume of gas being evolved. The distance of the receiver from the hydraulic main is such that the gases arrive at a sufficiently low temperature to prevent injurious interaction of the intermingling gases. When the gases pass through comparatively cool liquor or tar in the hydraulic main, the effect of decomposition by heat after the gases have passed the seal is less.

The published specification of the invention is illustrated by a dia-



Helps's Arrangement of Hydraulic Mains and Retort-Beds.

grammatic drawing [reproduced], which shows seven hydraulic mains of seven retort beds.

In it, 1 to 7 are hydraulic mains; and 11 to 17 are valves under the control of the operator for regulating the pull. The figures 101, 102, 103, 104, 105, 106, and 107 indicate pipes leading to a common receiver 8.

The distillation process is carried out so that the pressure inside the retorts does not fall below the pressure of the hot combustion gases outside the retorts, by maintaining there a pressure not below the pressure of the hot combustion gases, and charging all the retorts in a bed at substantially the same time. This is effected by continually testing the gas issuing from each set of retorts for atmospheric nitrogen, before it reaches the common receiver. The test may consist in continuously exhausting gas through small pipes and passing it through purifiers to take out the tarry matters, and continuously burning the gas in burners the size and appearance of which flames give an approximation of the quantity of nitrogen present. "If an excess of nitrogen is present, the corresponding valve is partially closed; the valves connecting the retorts at the first phases of distillation to the common receiver being more fully open than the corresponding valves of the retorts at a later phase to an extent found by experience, and checked, as above set out, by testing the issuing gas for atmospheric nitrogen."

The pipes leading to the receiver should be of sufficient length to allow the gases to cool sufficiently before arriving there. This temperature may differ somewhat "according to circumstances," but can easily be found by trial; for "the hydrocarbon value of the gas is easily ascertained, and any marked losses will be indicated by testing the gas at various points in the pipes leading to the receiver for its calorific value by leading it through a recording calorimeter, when any marked drop in such value will point to a deposition of carbon."

The same principles may, it is pointed out, be applied to vertical retort settings, coke-oven practice, or other systems, in which coal or the like is destructively distilled for gas or bye-product productions. "As an example, an undiluted gas of 600 B.Th.U. net per cubic foot may be first made and then every foot of this gas is diluted with one-half foot of air—thus making a gas of 400 B.Th.U. net per cubic foot."

What the patentee claims as his invention is: 1. In the manufacture of coal or like gas, distilling off a gas substantially without pulling-in inert gases, and afterwards diluting the gas with a diluent. 2. Distilling off a gas substantially without pulling-in inert gases, and subsequently diluting the gas with a diluent in a main from a nozzle or nozzles facing upstream. 3. Distilling off a gas substantially without pulling-in inert gases, storing the gas in a gasholder, and subsequently diluting the gas with a diluent in a main from a nozzle or nozzles facing upstream. 4. Charging the retorts in one bed all substantially at the same time; maintaining the retorts at a pressure not below the pressure prevailing outside the retorts; so arranging the outlet from the retorts that a different pull may be given to each bed of retorts; and afterwards diluting the gas with a diluent. 5. Charging the retorts in one bed all substantially at the same time; maintaining the retorts at a pressure not below the pressure prevailing outside the retorts; leading gas from several retort-beds with a common receiver while at a temperature sufficiently low to prevent undue or injurious reactions between the various gases; and afterwards diluting the gas with a diluent. 6. In the manufacture of coal gas as claimed in claims Nos. 1, 2, or 3, leading gas from several retort-beds into a common receiver while at a temperature sufficiently low to prevent undue or injurious reactions between the various gases.

Desulphurization of Gases.—No. 117,387.

Hemingway, H. W., of Seething Lane, E.C.

No. 17,165; Nov. 21, 1917.

In Patent No. 12,093 of 1901 was described a process for the desulphurization of gases containing sulphuretted hydrogen by treating them in purifiers with carbonate of iron, and a process for desulphurizing ammoniacal sulphide liquors by agitating them with carbonate of iron. For either of these processes, the carbonate of iron (preferably native spathic iron, finely ground) had to be obtained from outside sources. But according to the present invention, the process of desulphurization is carried on in such a manner as to recover the ferrous carbonate for re-use—thereby rendering the further introduction of supplies of spathic iron from outside sources unnecessary.

When applied to the desulphurization of coal gas, the gas is passed through scrubbers in the usual manner, and ammoniacal liquor derived therefrom is conveyed to a tank and there treated with ferrous carbonate. The liquor having thus become "sweetened," and the iron salt having subsided in the form of iron sulphide, the sweet liquor (ammoniacal liquor deprived of its sulphuretted hydrogen) is run off to a still, or returned to the scrubbers; while the sulphide of iron precipitate is converted into ferrous sulphate for use in the next stage of the process. The sweet liquor is conveyed to a second tank, and is there treated with the ferrous sulphate before referred to. The ferrous salt, absorbing carbonic acid, subsides as ferrous carbonate; and the sweet liquor (now containing a little extra sulphate of ammonia) is run off to a still, while the ferrous carbonate precipitate is withdrawn for re-use in the first stage of the process. The ammoniacal liquor, draining from the precipitate, is led to the ammonia still as before.

By the third stage of the process, ferrous carbonate is reproduced for use in the first stage, and the cycle of operations may be repeated without the introduction of further supplies of the ferrous salt, except so far as may be necessary for making good trifling losses in working.

The Directors of the Dorchester Gas Company report a further increase in the consumption of gas during the half year ended June 30, amounting to 1,659,700 c.ft., or 7½ p.ct. over the corresponding period of 1917. They recommend the payment of dividends at the rate of 8 p.ct. on the ordinary capital and 6 p.ct. on the preference capital, both less income-tax.

PARLIAMENTARY INTELLIGENCE.

HOUSE OF LORDS.

Progress of Bills.

The Maidenhead Gas Bill was read the third time, and passed.

The South Metropolitan Gas Bill and the South Suburban Gas Bill were brought from the Commons, read the first time, and referred to the Examiners.

The Burghs Gas Supply (Scotland) Amendment Bill was brought from the Commons and read the first time.

The Maidenhead Gas Bill and the Wandsworth, Wimbledon, and Epsom District Gas Bill received the Royal Assent.

Statutory Undertakings (Temporary Increase of Charges) Bill.

On Monday of last week, the Statutory Undertakings (Temporary Increase of Charges) Bill was read the third time, according to order, and passed.

The measure received the Royal Assent on Thursday.

HOUSE OF COMMONS.

Progress of Bills.

The Mayor, &c., of Battersea, the Hampstead Borough Council, the Lambeth Borough Council, the Leyton District Council, the Middlesex County Council, and the Mayor, &c., of Westminster have withdrawn their petitions against the Gas Light and Coke Company's Bill.

The Hammersmith Borough Council have withdrawn their petition against the Brentford Gas Bill.

The South Metropolitan Gas Bill and the South Suburban Gas Bill were read the third time, and passed.

Fuel and Lighting Order.

Mr. Gilbert asked the President of the Board of Trade whether it was proposed to issue any short form of the new Coal and Lighting Order that could be easily understood by the consumer. If so, would he arrange that copies could be supplied either at post offices or local town halls, so that consumers could obtain them easily and at once, and so realize the necessity for reducing immediately coal and lighting consumption.

Sir A. Stanley replied that a short and concise form of the Order for the benefit of consumers, and embodying the chief points of the Order in which the consumers were interested, had already been printed, and was being circulated to coal merchants and gas and electricity undertakings throughout the country at the present time. Inasmuch as consumers would have to approach these three sources for their application and requisition forms, it was decided that this was the best method of distributing the notice to consumers. He would consider whether any additional arrangements can be made on the lines suggsted by Mr. Gilbert.

Captain Carr-Gomm asked the President of the Board of Trade whether he was aware of the fact that, although the new Light and Fuel Order had now been in operation for over a month, the general body of consumers had no knowledge whatsoever of its existence; and whether he would explain why it was not possible to inform and instruct the public before the Order came into operation, so that the householders might have had the opportunity of economizing during the summer months, which was the period of the year when such arrangements could best be made without serious inconvenience.

Mr. Wardle, who replied, said the Order came into force on July 1. The clauses in the Order relating to applications for fuel and lighting and requisitions were only effective 42 days from that date—namely, Aug. 11. The necessary forms and notices were already in circulation in many districts, and the task of distribution would be completed before the end of last week.

"Financial Hardships" Bills.

The following Bills were withdrawn: Alliance and Dublin Gas Bill, Basingstoke Gas Bill, Cannock Gas Bill, Cardiff Gas Bill, Hampton Court Gas Bill, Hastings and St. Leonards Gas Bill, Liverpool Gas Bill, Longwood and Slaithwaite Gas Bill, Newcastle-upon-Tyne and Gateshead Gas Bill, Plymouth and Stonehouse Gas Bill, Richmond Gas Bill, Southampton Gas Bill, Swansea Gas Bill, York Gas Bill.

Burghs Gas Supply (Scotland) Amendment Bill.

The Burghs Gas Supply (Scotland) Amendment Bill, presented by Mr. Munro, went through its various stages, and was passed.

The Bill consists of one operative clause, as follows: "In addition to the purposes for which the Gas Contingent Guarantee Rate may be levied in terms of section 38 of the Burghs Gas Supply (Scotland) Act, 1876, the said rate may, and if at any time the revenue of the gas-works is insufficient for the purpose shall, be levied to provide for any annual sums required to be set apart as a sinking fund, or any other annual expenditure incurred under the provisions, and for the purposes, of the said Act."

Exports of Coal to Germany in 1913.

Mr. Wardle (Parliamentary Secretary to the Board of Trade), replying to a question by Mr. Outhwaite, said that in the year 1913 the exports of coal from the United Kingdom to Germany amounted to 8,952,328 tons, valued at £5,327,733.

Summer Time.

Mr. Gilbert asked the Home Secretary whether, in view of the necessity of saving gas and electricity for lighting purposes, he would consider as to extending the present Daylight Saving Order for another month, so that it would continue until the end of October in the present year.

Sir G. Cave replied that the question was carefully considered at

the time the Order was made, but it was not thought advisable to prolong the period beyond the end of September. The saving of light which would be effected in the afternoon would be largely counterbalanced by the additional consumption of artificial light in the early morning; and it was felt that the gain was not sufficient to outweigh the inconvenience and hardship which would be occasioned to the great body of persons who had to start work at an early hour. In fixing Sept. 29 as the date for the termination of "Summer Time" this year, he extended the period beyond the time recommended by the Departmental Committee; and it will continue for a fortnight longer than it did last year.

Coal Supplies.

Sir J. AINSWORTH asked the President of the Board of Trade what steps he was prepared to take to increase the output of coal from the collieries of the United Kingdom; and whether he could see his way to arrange that the Coal Controller should be prepared to provide and supply the necessary amount of coal required for industries and householders in the same way that the Food Controller has already provided for the supply of food required by the population.

Mr. WARDLE, who replied, said every effort was being made to diminish the decline in the output of coal which must inevitably result from the withdrawal of 75,000 miners from the mines for the Army. The Army Council were engaged in releasing 25,000 miners of medical categories B_2 and B_3 now serving at home. The Miners' Federation of Great Britain had given the Prime Minister a pledge to take every step in their power to improve the output. The Executive of the Miners' Federation of Great Britain were also issuing a manifesto on the subject.

Colonel WEDGWOOD asked whether they were taking the obvious steps of trying to get back B_2 and B_3 men from the Army whose return has been authorized, and were extending that to recovering B_1 men also.

Mr. WARDLE replied that for the present the B_2 and B_3 men were being recalled as rapidly as possible. B_1 men, however, were not being recalled at present.

LEGAL INTELLIGENCE.

BRIGHTON GAS COMPANY'S APPEAL.

Reversal of the Magistrates' Decision.

As briefly announced in the last issue of the "JOURNAL," the RECORDER OF BRIGHTON (Mr. W. P. G. Boxall, K.C.) has decided in favour of the Brighton and Hove General Gas Company their appeal against a conviction by the Justices for supplying gas of a calorific power of less than 500 B.Th.U. on various dates from March 15 to April 24 last.* There were seventeen convictions; and the Justices imposed a penalty of £5 upon each. The appeal was heard at a specially adjourned sitting of the Brighton Quarter Sessions on Thursday and Friday, the 1st and 2nd inst.

Mr. G. J. TALBOT, K.C., Mr. H. S. CAUTLEY, M.P., and Mr. L. G. HORTON SMITH appeared on behalf of the Gas Company; the respondents being represented by Sir ARCHIBALD BODKIN, Mr. BRUCE THOMAS, and Mr. J. E. RAVEN.

Sir A. BODKIN, in opening in support of the prosecution, said the Justices recognized there were difficulties in the way of the Company, and took them into account in the penalties imposed. The proceedings were taken under the Company's Calorific Standard Order of 1917; the average deficiency over the seventeen specified dates being 128 B.Th.U. The Company were using plant for the recovery of benzol and toluol; but if they had failed to supply gas at the standard under their own Order, they had failed to carry out a self-sought statutory liability. The price of gas had been increased from 2s. 11d. per 1000 c.ft. in 1915 to 3s. 8d. in 1918; and the consumer should be secured at this higher price against getting what was below the Company's own standard of 500 B.Th.U. The fact, however, was that the consumer had to burn more of the higher-priced gas to obtain the result formerly secured from a lower-priced article. On one of the specified dates, the gas actually supplied was 43 p.ct. below what it should have been. This was on the worst day; but on the best day it should have been 28 p.ct. better than it was. Taking the average, the gas should have been 34 p.ct. better. From April 30 onwards, it was noticeable that the average was 442 B.Th.U.—the deficiency being thus only 57 B.Th.U. The Corporation did not ask for penalties for the first 40 B.Th.U., which they thought fairly represented the impoverishment of the gas by the taking-out of the benzol and toluol, though they knew that the 500 B.Th.U. standard allowed for the extraction of these substances. It was represented to be the deliberate policy of the Company to supply gas of this low standard, for the purpose of eking-out the gas produced from the carbonizing of the coal, and to charge for it at 3s. 8d. per 1000 c.ft., as if it were the standard quality gas which they were bound to supply. This policy was determined upon because there were great difficulties in getting coal; and the Company had not the opportunity of using generous quantities of oil, so that they could enrich the gas up to the standard required. He believed that no gas company had stopped supplying gas throughout the war; and it was inconceivable that the Coal Controller would permit a gas company of this kind to leave Brighton in darkness. Yet the plea of the Company seemed to have been that they were obliged to supply impoverished gas, because they were afraid they would not be able to get coal. As a matter of fact, they always did get coal; and their policy was neither prudent nor necessary.

The RECORDER intimated, before evidence was called, that as the tests made by the Corporation were practically admitted, the onus of proof rested with the Company.

Mr. *Hugo Talbot* (the Town Clerk) and Mr. *Harry Webster* (the Corporation Gas Analyst) having given formal evidence,

Mr. *W. R. Herring* said that a reduction to the standard power of 500 B.Th.U. made the Company every reasonable allowance. Indeed, it was more than generous. The Company had an increased output of 15 p.ct. for 1917; but there would have been no such increase had the gas supplied been up to the proper standard. In 1914, the pressure was 30-10ths; but in March and April, 1918, it was 38-10ths. The effect of the increased pressure would be an increased consumption, unless the consumer regulated his apparatus. If the quality of the gas were improved, and the pressure reduced, it would meet some of the difficulties connected with the shortage of coal; but this course had not been followed at Brighton. The Company's deficiencies could be very considerably improved upon.

In cross-examination, witness maintained that, allowing for the extraction of products for the Ministry of Munitions, from properly carbonized coal a 500 B.Th.U. gas could be obtained.

Mr. *Isaac Carr* said that at Brighton there would be much less difficulty in obtaining light creosote for enriching than oil. It was against the interests of the consumer to be supplied at a higher pressure with gas of a reduced quality. At Widnes, instead of reducing the quality and increasing the pressure, he maintained the quality and reduced the pressure, with the result that there was a minimum of inconvenience, and he was able to reduce the consumption of gas, and therefore wanted less coal.

Mr. TALBOT, for the Company, said the section meant that if the defect in the calorific power was the result of causes beyond the control of the Company, they were not to incur penalties, on the simple and intelligible ground that they were not to blame. If, in the circumstances, they had done the best they could, they had not to pay a penalty. The Company's case was shortly this: Owing to circumstances entirely beyond their control, which might be summarized as the increased length of voyages of sea-borne coal, the difficulty of getting into Shoreham harbour, the great uncertainty of deliveries by rail, and in spite of repeated applications to the Coal Controller (whom they had given no peace), the Company had only been able to obtain enough coal to enable them barely to get through the year by doing the things they had done. If the Company had done what the respondents were now good enough to suggest they ought to have done, they would, in fact, have been compelled first of all to reduce and then to determine the supply of gas to the town. The other part of the story was as to oil. During a considerable part of the period, they were not allowed to get any oil at all; and during the whole time, not only were they rationed down to an amount quite insufficient to supply up to the required standard, but they were not able to get anything like the amount of oil they were allowed by the authorities. They had to consider various alternatives, and took that which was to the advantage of the consumer. He went further, and said it was the only one which any prudent gas company would have adopted; and the result was that, with the minimum of complaint, the Company had succeeded in keeping up a continuous supply of gas to the consumer, though of a much less calorific power than would otherwise have been the case. The Company had a high record in the gas industry, and would never have dreamed either of breaking the law or—what was perhaps even more important to them—injuring, disgusting, or dissatisfying their consumers, if they could possibly help it. They made the most strenuous efforts, and secured every ton of coal and gallon of oil they could lay their hands on; but not only could they not get enough coal, but much of what they did get was of very poor quality, and unsuitable for gas making. Then they were not able to get enough oil to enrich their water gas; and the supplies of both coal and oil were in the highest degree irregular. A stoppage of the supply to the town was only avoided by the Company making more gas than before out of every ton of coal carbonized—this necessarily involving an inferior calorific value. It was impossible both to keep up the supply and give the standard provided under the Order. The evidence should satisfy the Recorder that, in circumstances of unexampled difficulty, the Company had done their best; the case being exactly one provided for in the section.

Mr. *E. L. Burton* gave evidence as to the difficulty experienced in getting coal and oil, and said that with the supplies received during the past year it was not possible to manufacture gas of the standard quality to meet the increased demand, which during the six months ended Dec. 31, 1917, was 20 p.ct.

In cross-examination, witness said he was officially connected with eight other companies; but none of them had been compelled to reduce the value so low as Brighton. The gas, though of poorer quality, was costing the Company more than when it was better. In April last, they got down as low as about four days' supply of coal. Complaints received from consumers were fewer than usual last winter.

Replying to Mr. TALBOT, witness said that though during the last two or three years there had been no substantial increase in the number of meters, the actual number of consumers—that was, people in a house using gas—had increased tremendously. Where formerly there was an average family of five members in a house, there were now in many cases from twenty to thirty.

Evidence as to the difficulties in delivering coal and oil was given by Mr. *W. A. Hoskin* (of the Anglo-American Oil Company), Mr. *F. G. Pilley* and Mr. *Norman Bellerby* (of Messrs. Stephenson Clarke & Co.), Mr. *William Surridge* (of Messrs. Foster & Co.), and Captain *Bee* (of the steam collier "Seaford").

Mr. *C. H. Rutter* (Engineer and Manager to the Company) said the attempt to restrict consumption by one-sixth was not successful, even when the value was raised; nor was a circular-letter to large consumers, urging the utmost economy in the use of gas, very effective. Coincident with the abnormal increase in consumption, the Company had abnormal difficulties in getting the raw materials for the manufacture of gas. Under these conditions, the form their economy took was to make more gas. The effect was to reduce the calorific value; but it enabled them to give a continuous supply of gas, though of inferior quality, throughout last winter, without cutting it down or

* See "JOURNAL," Vol. CXLII., p. 384.

reducing the pressure. There was no other way in which a reasonable and prudent gas company could have dealt with the situation, having regard to the interest of the consumer. Indeed, it was the only policy. At one period, the Company had less than a week's supply of coal or oil; and in both March and April this year the stock caused him many sleepless nights. Some of the coal they did receive was the worst he had ever seen for gas making. If the Company had got the coal they contracted for, they would have been able to give the full calorific value; but as they did not, it was impossible. Since the hearing before the Justices, he had gone carefully into the question of what would have happened if the Company had supplied gas of the statutory calorific value; and he found that they would have exhausted their stock of oil on Aug. 31, 1917, and would have run out of coal temporarily during the week ending Nov. 23. The idea that the increased consumption was due to inferior gas was quite incorrect. The figures showed that when they increased the calorific value, the consumption did not diminish.

Cross-examined, witness said the Company were supplying gas of less than 500 B.Th.U. during the last nine months of 1917. If they had reduced the pressure even slightly, many consumers in the outlying area would have had no gas at all. Whenever they had sufficient oil and coal, they used it to the full, and gave the consumer the benefit.

Mr. *F. Smallbone* (Assistant Engineer and Works Superintendent) spoke of the bad quality of the coal received, which had the effect of producing a smaller quantity of a poorer gas.

Mr. *Henson Infield* and Alderman *William Jago* expressed the opinion that a continuous supply, even at times of an inferior quality, was of far greater importance than an intermittent supply.

Mr. *W. J. A. Butterfield* said he considered the Company's plant in 1917 amply adequate for the business they had any reason to expect. If they had used up all the coal and oil they had, and kept the standard of gas up to 500 B.Th.U., the supply would have been interrupted by the last week in November. The average calorific value from July 1 to April 26 last was 420 B.Th.U.; and the highest average theoretically possible of attainment from the Company's supplies of coal and oil was 428 B.Th.U.—assuming all the coal to be good gas coal, that the water-gas plant could be worked continuously at maximum capacity, and that there was foreknowledge of supplies. The course the Company took was the best in the circumstances.

THE JUDGMENT.

The RECORDER, in his judgment, said it was quite clear that on the seventeen days in question, and no doubt for many months previously, the Company had been delivering a gas far below the standard—somethink like 20 p.ct.—and this to the injury of the ratepayers. In these circumstances, it was undoubtedly the duty of the Corporation to take steps to remedy the matter; and he did not suppose anyone could complain of the action they took in pressing for penalties against the Company after they had intimated that a considerable concession would be made as to the standard of gas, and that if it was kept up to 450 B.Th.U., they would be content. The Company were unable to accept this position, which was probably a consistent attitude to take up, in view of their contention that the defect was one which was unavoidable, and due to circumstances beyond their control. They got more coal apparently in 1917 than in 1916; yet, owing to the increased consumption, it was insufficient for their purpose, and they had to regulate their supplies as carefully as they could. In the same way, the oil supply was insufficient. It had been argued that they failed to put the matter frankly before the authorities. The evidence showed that had they continued the supply up to the standard, they would for two weeks in October last have had to restrict the output by 10 p.ct., which would have occasioned very serious injury to their consumers; that by Nov. 30 they would have had to stop supply altogether for a fortnight; and that there would have been a similar state of things a little later. This indicated the dilemma in which the Company were placed. They were carrying out the supply to a very large town—or, rather, two towns—exceptionally crowded with visitors, and in a time of war, when the hospitals were full, and when numerous other institutions were depending in a great measure upon the gas the Company were supplying. It was a great responsibility cast upon those who had to conduct this industry. They had to decide what they should do. They might have been wrong in their decision; but provided they used to the very best their knowledge and skill, the defect which arose was from circumstances beyond their control. It was suggested they might have supplied gas up to the standard, and, by altering the pressure, have restricted the consumption. But it was difficult to see why they should not have adopted such a course if it was really feasible. Until the last witness was in the box, he had not made up his mind; but, on the whole, he had come to the conclusion that the Company had made out their case that the defects were produced by circumstances beyond their control. It was a time of war, and of great difficulty; and they had satisfied him they could not have avoided the circumstances. He therefore thought the conviction must be quashed. But he should like assistance upon the question of costs. Generally, the costs followed the result; and this would no doubt include the costs below. But he thought the Corporation were quite right in protecting their ratepayers, and most certainly justified in bringing the proceedings. There should be no costs below on either side, but what course should be taken here?

Mr. TALBOT intimated that his instructions were not to ask for the costs below; but he must claim the costs of the appeal.

Sir A. BODKIN urged that there was no difficulty in the Company producing before the Justices the evidence and tables they had put before the Recorder; and that as they failed to do this, it disentitled them to costs.

The RECORDER failed to see how he could resist the claim for costs of the appeal. There would be no costs before the Justices; but the appeal would be allowed with costs.

There have been sold by auction 158 fully-paid £2 10s. ordinary shares in the Hornsea (Hull) Gas Light and Coke Company, Ltd. They realized from £3 15s. to £4 each.

MISCELLANEOUS NEWS.

SOUTH SUBURBAN GAS COMPANY.

The Ordinary Half-Yearly Meeting of the Company was held last Friday, at the Cannon Street Hotel, E.C.—Mr. CHARLES HUNT in the chair.

The SECRETARY (Mr. Wilfrid Wastell) read the notice convening the meeting; and the Directors' report and the accounts were taken as read.

AN EVENTFUL HALF YEAR.

The CHAIRMAN, in moving the adoption of the report and accounts, said: Ladies and gentlemen, it can hardly be necessary to remind you that the period which has elapsed since we last had the pleasure of meeting you has been more than usually eventful. First of all, there is the Bill for the acquisition of the Dartford undertaking; then, the parliamentary inquiry into the application by various gas undertakings (our own among the number) for temporary relief from statutory obligations as to the price of gas and dividend, and the proceedings resulting therefrom; the new Fuel-Rationing Order by the Controller of Coal Mines; and last, though by no means least, the increasing gravity of the position as regards the supply of coal. With your permission, I should like to say a few words on each of these subjects, so as to make our position with regard to them as clear as possible.

THE COMPANY'S BILL.

Our Bill, it will be remembered, provided for a temporary increase in the standard price of gas, sufficient to enable the Company to maintain the standard rate of dividend of 5 p.ct. with the then selling price of 3s. 6d. per 1000 c.ft., with a further provision to enable us to resort to our reserve fund (accumulated out of divisible profits) to make up the dividend to 5 p.ct. should the statutory dividend at any time fall below that amount. The object of this was to provide, without further taxing the consumer, against any addition which might have to be made to the price of gas beyond 3s. 6d., such as has, in fact, already taken place. These proposals unexpectedly delayed the progress of the Bill, owing to the Government decision to refer all such matters to a Select Committee of the House of Commons; and their final decision to deal with these by way of general legislation ultimately left us no alternative but to withdraw them. Other clauses of the Bill had also to be withdrawn—notably those relating to the supply of electricity. These, strange to say, having regard to all that has recently been said and written about the conservation of the Nation's fuel resources, failed to attract those whom they were designed to benefit. The Bill has now made good progress, and should, in the ordinary course, become law during the autumn session.

THE RELIEF BILL AND SOME OF THE LESSONS.

The very substantial, not to say overwhelming, majorities by which both Houses of Parliament expressed their sense of the grave inadequacy of the relief recommended by the Select Committee of the House of Commons from what have come to be known as the "financial hardships" of gas undertakings, are not only a complete vindication of the justice of our claim, but also a distinct encouragement for the future. Those who did not pitch their expectations too high, and have all along been prepared to bear some part of the burden which has resulted wholly from war conditions, will probably consider the final settlement not an unsatisfactory one; while everybody, whether fully satisfied or not, cannot but feel that it has greatly lessened a rankling sense of injustice, and probably paved the way for a permanent settlement more in keeping with the greatly altered value of money and other new conditions. The original recommendation of the Select Committee appears, if I may say so, to have wholly ignored two most important considerations, although both of them find a place in their report. One is, the hardship and possible suffering endured by a very numerous body of small investors by the dwindling away of dividends, upon which many of them depend almost entirely for a livelihood; and the other, the almost universal readiness of consumers—not of gas only, but of all other commodities—to pay increased prices, provided that these are the legitimate outcome of war conditions, and not the result of profiteering. Much has been said by our opponents about the hardship to the small gas consumer in having to pay the very small addition to his gas bill—I think the sum of 1s. 3d. per annum has been mentioned, and certainly it cannot amount to much more—to provide what is still an inadequate return upon the capital invested for his supply; whereas the fact is that those who use slot meters are practically the only class of consumers who, notwithstanding the Order requiring a reduction of consumption of one-sixth and the present exceptionally high price of gas, are actually increasing their consumption. If to these considerations I may add a third, it would be to emphasize the fact that the present adverse conditions were never contemplated by, nor did they form any part whatever of, the original sliding-scale or maximum price compact of any gas undertaking. And the interpretation placed upon our obligations under that compact by the recommendation of the Select Committee, which is in effect that every shilling of dividend may disappear unless and until Parliament gives relief, calls for some permanent remedy. They manage these things better in the Colonies. At all events, the New South Wales Legislature lately passed an Act, providing for a revision of the standard price under the sliding-scale, according to variations in the cost of production and distribution, taking all circumstances into account. That is one direction in which our thoughts naturally turn in connection with the post-war settlement which the President of the Board of Trade has led us to expect. His words are as follows, if I may be allowed to quote them:

> **After the war, it will be necessary for the Government to very seriously consider the whole situation, not only with respect to the undertakings now under discussion, but also with regard to all statutory undertakings which are limited in their charges by Acts of Parliament, in some instances, passed many years ago. After the war, it is very likely**

that we shall be living under entirely different conditions; and therefore it will be necessary to consider whether the basis upon which statutory limitations have been established are, under the altered circumstances, reasonable and fair.

Need I say how warmly we shall welcome the revision which is here foreshadowed, in connection with which it may not be inopportune to point out that much of the present trouble has arisen through the practice which has been allowed to prevail of fixing standard or maximum prices too low. I have myself contributed in my time somewhat to this result; but everyone must now admit the viciousness of a policy which, it is but too evident from the experience through which we are passing, may reduce a public utility undertaking to something like beggary, through circumstances over which it cannot exercise the least control. Certainly a much more liberal policy in this respect has become a necessity.

APPRECIATION.

I am sure it will be wished that we should express our very high appreciation of the able and convincing statement of the case for the companies which was made by the witnesses who appeared before the Select Committee on their behalf, prominent among whom were Mr. D. Milne Watson, the Managing-Director of the Gas Light and Coke Company, and our friend and colleague, Mr. Charles Carpenter, D.Sc. It is a great pleasure also to acknowledge the very valuable assistance of all who in their places in Parliament contributed so powerfully to the final result; and I venture to believe that the names of our esteemed Deputy-Chairman, Sir Fortescue Flannery, and the Rt. Hon. Sir Daniel F. Goddard, will long be remembered in connection with one of the most striking and important events in the history of gas legislation.

FUEL RATIONING.

Fuel rationing and coal shortage are cognate subjects. The first appearance of the shortage was visited upon gas and electricity consumers by an Order requiring an all-round reduction of consumption of one-sixth. Needless to say, this was loyally responded to by the gas companies, who did all in their power to promote economy among their consumers. But this Order had not been in operation many weeks when it was replaced by one combining coal and coke with gas and electricity. On its first appearance, this Order was seen to be open to serious objection, and an endeavour was made by the National Gas Council to improve it. We on our part felt it to be our duty to draw the attention of the Board of Trade to its inequitable treatment of different classes of consumers; and at the same time to deprecate the withdrawal of the first Order (which was a clear call to all consumers alike) before sufficient time had elapsed to test its effect. Observation of this had convinced us that it was likely to prove satisfactory at least as regards the ordinary consumers; and a reduction of their consumption for the three months during which the Order was in operation, of 14·1 p.ct., has confirmed this view. Now, as regards the new Order, a good deal of sympathy has been expressed with the small householder as to the hardship which this is likely to inflict upon him. But such sympathy seems to be entirely misplaced, if one may judge from the circumstances of our own small consumers; and, of course, I speak for no others. These, so far as can be ascertained, will, on the average, be at least as well off under the new Order as they are at present; while in many instances they will become entitled to more fuel in the shape of coal and gas combined than they now find sufficient for their requirements. In fact, a number of cases, taken quite at random, show an average surplus of about 30 p.ct. On the other hand, the larger consumers, who are a much less numerous body, are placed in a very different position. Many of these consumers "use gas wherever possible," to quote the official injunction; and all of them depend more or less upon gas-fires and other gas-heating appliances. These are now to have their consumption very seriously reduced, with what effect may be imagined. It is very hard to believe, although freely reported, that the purpose of this measure is to throw practically the whole burden of the desired reduction of consumption upon these consumers. But, be this as it may, it cannot but inflict upon them serious discomfort, for a quite inadequate result; and whether taken as a whole the measure will effect any appreciable reduction of consumption, is at least open to doubt. However, when all is said and done, the ugly fact remains that, owing to a combination of circumstances which it is not necessary to particularize, there is not, nor can there be for some time to come, enough coal to go round. The coming winter may have to be faced with quite inadequate stocks of coal, in which case the Controller of Coal Mines may propose, but the coal-miner will dispose. It is therefore incumbent upon every one of us, Order or no Order, to observe the most rigid economy in the consumption of both coal and gas. It may not be easy to understand why, having regard to the multitude of householders who do not use so much as even 2 tons per annum, not less than 2½ tons of coal are to be supplied to any householder whose annual requirements in coal and gas may exceed that quantity, except by permission of the fuel overseer, for this appears to be a direct incentive to unnecessary use of coal; nor why, at such a juncture as the present, so little inducement is held out by the Order to use gas instead of coal for domestic heating, so as to save both transport and residuals. However, it will be some little relief to the harassed householder that the Government are at last turning their attention to other and, as we believe, more promising directions. The announcement has just been made that some of the men imprudently taken from the coal mines are to be returned; and also that steps are to be taken to check waste of coal in certain specified and other industries. This crusade against waste might be usefully extended as recently suggested to the Controller of Coal Mines by members of the gas industry.

COMMENTS ON THE ACCOUNTS.

With regard to the accounts, there is but little to remark, except that they unfortunately repeat the too familiar tale of greatly increased expenditure. Coal has cost more by £15,896 than it did in the corresponding half of last year; while every other item in the cost both of manufacture and distribution is also higher in amount. This, however, I should explain, is largely, although by no means wholly, due to what was formerly war bonus having been converted into war wage, and charged against each item to which it relates, instead of to a separate account at the foot of the expenditure column. During the half year there was a further and considerable rise of wages, the full effect of which will be felt in the current half year. There has also been another increase in the price of coal—this time of no less than 4s. per ton—which was literally sprung upon us too late to enable provision to be made for it in the price of gas as from the Midsummer quarter. A further increase of price may therefore become necessary, to date probably from Michaelmas. After payment of the statutory dividend at the reduced rate of 3½ p.ct., the balance of undivided profit to be carried forward to the next account will be increased by £5517; but the greater portion of this represents reduction of dividend owing to the increased price charged for gas, so that the advantage of this larger carry-forward is more apparent than real. Thanks to the Statutory Undertakings (Temporary Increase of Charges) Act, we ought now to have touched bottom in regard to dividend; and it is hoped that the next one will be at the rate of £3 15s. p.ct. But for this Act it would certainly have been reduced to £2 16s. 8d. p.ct. according to the present price of gas.

AT THE FRONT.

With regard to the part taken in the war by the Company's employees, you will be interested to hear that 454 in all have joined H.M. Forces since its commencement. Of these 55 have been discharged, 41 of whom re-entered the Company's service, although 9 of the number have since left it. The number of those who have laid down their lives for their country has been increased to 40; while 5 are prisoners of war in Germany, and 4 are missing. Henry W. Mudd has had the distinction conferred upon him of the Belgian Croix de Guerre—thus making the fifth on the list of those who have won special distinction. May I add that the total amount paid out from the war fund to the wives and other dependants of those on service, is now £12,766. As you are aware, this fund is contributed to by the employees and Directors, and the Company, in equal proportions, and is administered by a Committee of Co-Partners. I should like on this occasion to be allowed to make an addition to this somewhat bald statement, expressive in some degree of our immense obligation to all who have left their homes to fight our battles, that our homes may remain inviolate, and the future of this dear country of ours be assured. Let me also say how very proud we all are of their heroic achievements, and deeply thankful for the favourable turn which events have taken during the last few weeks, and particularly for the very gratifying success announced this morning.

The London County Council and Gas Undertakings.

The Deputy-Chairman (Sir Fortescue Flannery, Bart., M.P.), in seconding the motion, sketched the proceedings in Parliament in connection with the application of gas companies for relief. The "financial hardships" which it was sought to remove were due to the circumstances of war, which were not anticipated at the time that the Legislature of 42 years ago fixed the figures of the sliding-scale. The lapse of 42 years was in itself sufficient justification for reconsideration of the terms; and added to that were the circumstances of war as compared with those of peace. He described the report at which the Select Committee of the House of Commons arrived as an extraordinary one, in that instead of giving the full measure of relief by removing the disabilities of the sliding-scale while the war was on, it gave only half. In his opinion, the London County Council were very much to blame in their relations with the gas industry. He did not know why it was; but there seemed to be continual prejudice in all the actions of the London County Council against the gas companies. He ventured to say that the influence of the London County Council had a great deal to do with the extraordinary and unjust report and recommendation which the Select Committee arrived at. However, it was most unusual for the House of Commons to set aside the recommendations of any of its Select Committees. Like the laws of the Medes and Persians, such recommendations had hitherto been considered almost, if not quite, unalterable. But in this instance, the circumstances were so unjust, so grossly unjust, that, in the public interest—the widest interest of London, and of the citizens of London—as well as of the gas consumers and shareholders, the matter was vigorously taken up; and the House of Commons decided, by a very large majority, in favour of more justice being given to the gas undertakings. It was not on the question of dividends only that justice had been done, but on that of maintaining the very existence of the gas industry, because if the report of the Select Committee had been acted upon, the financial stability of the industry could not possibly have been maintained.

The motion was unanimously carried.

Declaration of Dividend.

On the proposition of the Chairman, seconded by Mr. G. Waller, dividends were declared at the following rates per annum: 5 p.ct. on the preference stock, 3½ p.ct. on the ordinary stock, and 3½ p.ct. on the West Kent ordinary stock, less income-tax.

Votes of Thanks.

Proposed by the Chairman and seconded by Sir John Boraston, a hearty vote of thanks was passed to the Engineer (Mr. S. Y. Shoubridge), the Secretary (Mr. W. Wastell), their staffs, and the employees generally; and subsequently, on the motion of Mr. Charles Beadle, seconded by Sir George H. Whitehead, and supported by Mr. Webb, the services of the Chairman and Directors were duly acknowledged.

Huddersfield Gas-Workers' Hasty Action.—The gas-workers at Huddersfield adopted the high hand last Thursday week, and ceased work without notice, refusing arbitration, owing to a disagreement with the Corporation Wages Sub-Committee as to the interpretation of an arrangement made with the Committee, and also as to the meaning and effect of a Government award. The Committee sat for several hours during the day; and, rather than see the men at the front handicapped by the slightest shortage of essential commodities, they conceded the workmen's demand, under strong protest.

TOTTENHAM DISTRICT LIGHT, HEAT, AND POWER COMPANY.

The Annual Ordinary General Meeting of the Company was held last Saturday, at the Offices, No. 639, High Road, Tottenham—the Right Hon. Sir Daniel F. Goddard, M.P., in the chair.

The Secretary (Mr. E. J. K. Fussell) read the notice calling the meeting; and the Directors' report and the accounts were taken as read.

A Much Controlled Industry.

The Chairman, in moving the adoption of the report and accounts, said perhaps the principal feature in connection with the half-year's working had been that the Company had come more and more within the toils of Government interference and control. They were very far from being their own masters in their own house nowadays. They had to take just what they could get from the Government, and what the Government allowed them to take, and to put as pleasant a face on it as they could. He need scarcely remind the proprietors that almost everything with which the Company had to do was under Government control. Coal had been raised in price in a very serious manner without any notice; and last October retrospectively. At the beginning of the war, there was a rise of 4s. per ton at the pithead; last October, 2s. 6d.; in June, 2s. 6d.; and subsequently an additional 1s. 6d. So that altogether, since the commencement of the war, the Company had had the price of coal raised by 10s. 6d. Shipping was also controlled. The freight on ships, which before the war was somewhere in the neighbourhood of 3s. per ton, was now regulated; and the Government price of 19s. per ton was almost prohibitive. Then, of course, oil entered largely into their calculations; and oil was controlled not only as to quantity, but as to price. The price now fixed by the Government was 1s. 4d. per gallon; whereas the Company used to pay 2¼d. and 2½d. per gallon. This was a very considerable addition. Wages had gone up very largely. He did not know whether he should say this was due to Government control, except that the fact was there was an inquiry into the question of wages; and the Government fixed the rate. There was added to every man's wages 20s. per week above the pre-war rate, and besides this the 12½ p.ct. that had become so notorious, which, as the proprietors would remember, was introduced by Mr. Winston Churchill especially for application to skilled munition workers, but which, of course, had become expansive, and now extended to almost every class of worker everywhere. The Company had had to pay this the same as all other employers. Then, in regard to residuals, from which they always hoped to get back a large portion of the cost of their coal, these had also been controlled by the Government. Before the war, it was the aim of gas undertakings generally to get back 60 p.ct. of the cost of their coal through their secondary products. Many companies got more. He was Chairman of a Company which realized 70 p.ct. of the cost of their coal by the sale of residuals. But the effect of the increased cost of coal and the controlled prices of residuals had brought the percentage down to something like 47, which made a material difference in the result of the working. Tar was controlled. The Company could not sell their tar except through a tar distiller. They used to have an enormous demand for dehydrated tar—tar deprived of its lighter oils. They were not allowed to sell their tar now for road purposes without a licence, and the licences were a very limited quantity. Then another great source of revenue was sulphate of ammonia; and the price of this was now controlled by the Government.

Rationing Gone Mad.

On top of all these things came the Fuel-Rationing Order, which he (Sir Daniel) ventured to think was rationing gone mad. [Hear, hear.] How it was going to be carried out, he really did not understand. Anyway, it was a very expensive business. If any of the proprietors had seen anything of the papers and forms—numbered forms—which had been circulated, and had to be filled up by everybody, he thought they would agree with him there had been a great waste of paper and printing, and there would be a great waste of time, and a great increase of anger, in having to go through all this work. But the serious part of the Fuel Order to the Company was not whether it could be carried out. They must do their part in this. The serious thing to the Company was that, if it succeeded, and less gas was sold, it would mean that the cost of gas must be increased. While they sent out less gas, they could not diminish their standing charges. These remained just the same, however much they decreased the output. They could not get rid of clerks and staff; they must have them, whether the output was large or small. This was an expensive thing to them. They considered that it meant an extra cost to the undertaking of 2¾d. per 1000 c.ft.

War Costs and the Price of Gas.

He would sum up these various considerations in a money form; so that the proprietors might have some idea of how they worked out to the Company. The extra cost of raw materials—that was to say, coal, oil, and suchlike—was 11½d. per 1000 c.ft.; wages had increased by 5d.; manufactured materials which they had to buy—plant renewals, replacements, and that sort of thing—they reckoned would cost 4½d.; then to this had to be added the 2¾d. on account of the Fuel-Rationing Order; and they considered the extra cost of the gas would be 1s. 11¾d. per 1000 c.ft. The proprietors would be aware that the Company had already raised the price of gas from 2s. to 3s. 8d.; but the last increase of 4d. did not affect the prepayment meters. There was a little on their side, and so the Directors thought they would not touch them at all. Therefore, the Company did not get the full benefit of the 3s. 8d. from the whole of the consumers. A fair figure would be 3s. 6d. This was an extra cost of 1s. 6d. Then by reason of the sliding-scale, the dividend had been decreased by 2½d. per 1000 c.ft. So when he reckoned this, it showed they were only getting back 1s. 8¼d.; whereas he had just demonstrated that the extra cost of supplying the gas was 1s. 11¾d. The proprietors would gather from these figures a clear indication that the Directors would next Michaelmas have to raise the price of gas again. He did not want them to deduce from his remarks that the interference and control of which he had spoken were not warranted. He had no doubt the necessity was great. He had no doubt there was difficulty in getting coal. He had no doubt the Government were confronted with many difficulties. He was not criticizing them. None of them could expect to go on without being affected by war conditions. But for the purpose of stating clearly what the position of the Company was he put the figures before them.

The Financial Credit of an Undertaking—The Select Committee's Mistake.

He should like to make a further observation. The effect on the financial position of an undertaking like this was serious. It affected their credit, which would be seen in this way: In pre-war days, the Company and the consumers (the two must be coupled together) obtained the use of £117 for every £100 of capital raised. The difference was the premium that was paid for the capital. If the Company wanted to raise money to-day, they would only get £70 for every £100. They would have to pay the dividend on £100, but they would only get the use of £70. This was a very serious effect. Business men controlling large undertakings fully realized that upon the established credit of the business depended the cost of raising money cheaply for the extension of the business. Good credit was of the very essence of business. Cheap capital spelt success; and in the case of a public utility company such as this, cheap capital meant cheap gas. Many did not seem to realize the close connection there was between capital and the consumer. The public generally looked upon the men who held the capital as profiteers. He did not think anybody could really consider the true case of the investor in gas stock, and call him a profiteer in these days. But this was quite a common view. The gas investor was called capitalist and profiteer; and the poor consumer was the sufferer. But it was a fact that as the capital became dearer, so the charge upon the consumer became greater. It must be so; and this was just one of those facts that he thought was seriously lost sight of by the Select Committee that was set up by the Government to inquire into the "financial hardships" of gas undertakings. The Committee seemed afraid of putting a temporary extra cost upon the consumer, whereas by their recommendations they were depreciating the value of capital, and, in effect, putting a permanent—not a temporary—extra charge upon the consumer, by reducing the credit of the undertaking, and so making the capital of the undertaking dearer.

Points from the Accounts.

These were all the preliminary remarks he wished to make; and he would now turn to the accounts for the half year. The capital account, it would be seen, showed an expenditure of £12,204, for new buildings and plant. This amount was reduced by the ordinary amount of depreciation by £7416. The net addition for electricity capital was £124. During the half year, there had been raised £70,000 by the issue of redeemable mortgage bonds, paying 6 p.ct. interest. There they had a confirmation of what he had been saying. Before the war they would have raised this money at 4 p.ct. Their credit had gone down by reason of the higher charges; and therefore they had to pay more for capital. On the revenue account, coal had cost something like £20,000 more. As a matter of fact, the price was more than 2s. per ton greater than in the corresponding half year. On the other hand, oil had cost very much less. They had saved £11,715. The explanation was that they could not get the oil; and therefore they could not use it. They had had to use much less oil in consequence; and it showed in the balance-sheet in that way. The item of repairs and maintenance of works was very heavy—£21,725 more. The item was an unavoidable one for several reasons. First of all the demand for gas had been great for some time now; and they were obliged to renovate, or completely restore, the old works at Ponders' End. This, of course, was not a capital charge; it was a revenue charge, and came out of that account. Then the first set of verticals—the No. 1 set, and not the new section—had had to be completely restored, and this had fallen on the half year, and was included in the account. It would be understood that in all these works they were using several materials—bricks, retorts, cement, steel, and iron; and all these things had gone up so enormously in price that this must reflect itself in the item. The item was a very large one; but it could be fully justified. He thought, too, it would convey to the minds of the proprietors how much costs had gone up, and how they had to pay them. Another thing would be noticed. In the corresponding half of last year, there was an item of £4000 carried to renewals account. This time there was nothing carried to renewals account, because it had all been put into repairs and maintenance. So if they took repairs and maintenance a year ago, and added the £4000 to it, this would be the figure in comparison with the £41,621 this year. Rates had gone down from £6270 to £4793. This was very satisfactory; and it was due entirely to the reduced assessment. There was no question about it, the undertaking was formerly too highly assessed. Mr. Fussell with the staff went diligently into this matter, met the Assessment Committee, and the reduction of the assessment was made by agreement, without arbitration or outside cost. It was a matter of congratulation that they had put this on a sound footing, and had done it by means of their own staff, rather than going outside. War bonuses had risen very largely—from £6083 to £18,566. This was due to the wages inquiry, and to the fact that the 12½ p.ct. had been added to wages. He did not know whether it should now be called war bonus, because it had to be taken as regular wages, and treated as wages, and overtime had to be calculated on this in addition to the ordinary wage. The number of the employees who had gone to the war numbered 263—a very large number for this Company. Since the war began, the Company had lost 45 of their men and seven since the last meeting. The Directors and the proprietors deplored the loss of these brave men. They had been looking forward to the time when they would come back to fill the places which had been kept open for them. They would see their faces no more; but they would think of them as men who had done their duty, and served their country well. The sale of gas had increased; but he thought he ought to mention two factors which affected the revenue from gas. For the whole of the half year under consideration, the price of gas in the Tottenham area was 3s. 4d., and in the Enfield area 3s. 9d. In

the corresponding half year, these charges were only in operation for three months; and this affected the comparison. The other remaining factor was the effect on the undertaking of the Rationing Order, 1918, which came into operation on April 2. The object of it was to reduce by one-sixth the consumption of gas for purposes exclusive of munitions factories. The Company tried to comply with the Order. As a matter of fact, so far as private lighting was concerned, it was carried out. In the comparison, this must therefore also be taken into account. In the general result, residuals had come out very well. They had received £55,527, as against £44,315. This would have been a good deal better, especially in regard to coke, but for a circumstance which he would explain. In putting to work the new No. 3 section of verticals, they had to use great quantities of coke to heat them up. These retorts were enormous things; and they took a large—he was almost going to say an extravagant—quantity of coke for heating them up. The coke used in this way, they had lost for sale; and it did not appear as a profit under residuals. The gross profit for the year amounted to £28,818, as against £31,240—in other words, £2422 less. By paying the statutory dividends, they would have to draw a small amount from the reserve—£552. He might say a word in regard to the electricity part of their undertaking. The business was increasing, the output had advanced by 34 p.ct. But, unfortunately, the cost of production had increased still higher. Therefore the profit had fallen by £121. This had obliged the Board to equalize matters. The price of electricity had been raised by 1d. for lighting purposes; and by ½d. per unit for power purposes. After paying the statutory dividend, the undivided profit and reserve funds showed a balance of £74,573, against £70,339 last year.

As to the Future.

He supposed the proprietors would wish him, in making this summary of the half-year's working, to say something as to the future. He could not say very much. He did not know very much about the future himself; he could not therefore prophesy. The price of gas was advanced on July 1 by 4d. This, however, did not affect the prepayment meters. Coal had advanced by another 4s. per ton, which practically meant another 4d. per 1000 c.ft. The extra cost of labour to which he had referred only affected one quarter in the period under review; in the current half year, it would affect the whole of it. The only thing he could see was that there must be a further increase in the price of gas at Michaelmas; but he was not prepared to say at the moment how much it would be. But the Directors might be relied upon to keep it as low as they could consistent with maintaining the works in thorough efficiency and condition.

Mr. Henry Bailey seconded the motion.

The Chairman, referring to the severe illness through which Mr. Bailey had passed, expressed the pleasure of his colleagues and the proprietors at seeing him back among them.

Mr. Michell thanked the Chairman for his masterly, able, and luminous address. He asked the Chairman what was likely to be the result of the recent legislation upon the future of the Company. He was glad the House of Commons did not confirm the recommendation of the Select Committee. It was also gratifying to find that, in the circumstances, the half-year's report was not more unfavourable.

The Chairman replied that at the present time the recent legislation had no effect upon the Company, because they were not above their standard price of 3s. 8d. The Act would only have effect when they were above the standard price. When the price got to 4s. 3d. per 1000 c.ft. they would come under the influence of the Act.

The Dividends.

Mr. Riddell asked a few questions regarding various items in the accounts; and the Chairman gave the information required.

The Deputy-Chairman (Mr. Henry Woodall) proposed the declaration of dividends at the rates per annum of 5 p.ct. on the preference stock, 5½ p.ct. on the "A" stock, and 4 p.ct. on the "B" stock, all less income-tax. He remarked that, as would be seen from the accounts, they had practically earned the dividends; and, looking at the dividends paid by some of their neighbours at the present time, he thought they might be fairly satisfied with those they themselves were able to declare. The reason they were able to do this was that the Company's standard price was somewhat more in keeping with the existing condition of things than were the standard prices of some of their neighbours. They were still paying more than the standard dividend. The standard dividend of the "B" stock was 3½ p.ct.; and they were paying 4 p.ct. At the present price of gas, they would be able to pay 3⅜ p.ct.; but from what they had heard from the Chairman, it was possible it would go still lower. Sir Daniel had told them that it would be necessary to further increase the price; but they hoped they would not have to avail themselves of the Act which had just been passed, and which gave some relief to those who were unable to pay more than a certain percentage of their standard dividends. The only serious trouble before them was the question of coals and materials. If they were only able to get coal to supply the needs of their consumers, and materials to keep the works up-to-date and to carry out repairs, he thought they would also be in a position to pay a reasonable dividend under the circumstances to the proprietors.

Mr. H. D. Ellis seconded the motion, which was unanimously carried.

Re-elections of Directors and Auditor.

Moved by the Chairman, and seconded by Mr. Meyers, Mr. Henry Bailey was re-elected a Director, as was also Mr. James Randall, on the proposition of the Chairman seconded by Mr. H. Mitchell.

Proposed by Mr. Riddell, and seconded by Dr. L. P. Scott, Mr. William Cash, F.C.A., the retiring Auditor, was re-appointed.

Mr. Bailey, Mr. Randall, and Mr. Cash responded; the last-named taking the opportunity of acknowledging the great work which the Chairman did in the House of Commons on behalf of the gas companies in securing in the Act which had just been passed a material amendment of the Select Committee's recommendation.

A Vote of Thanks.

On the motion of Mr. Michell, seconded by Mr. A. W. Reid, and supported by Mr. Moore, a hearty vote of thanks was passed to the Chairman and Directors, to the Chief Engineer and General Manager (Mr. A. E. Broadberry), to the Secretary (Mr. Fussell), their staffs, and the employees generally. Sympathy was also expressed for the relatives of those of the employees who had fallen in the war.

The Chairman acknowledged the vote on behalf of all included in it, at the same time observing that the Directors agreed very heartily with all that had been said as to the responsibilities and anxieties which mainly rested upon their Chief Engineer and General Manager and his staff, and as to the excellence of their worthy Secretary.

MALTA AND MEDITERRANEAN GAS COMPANY, LTD.

Working under Difficult Conditions.

The Ordinary General Meeting of the Company was held last Friday, at the London Offices, Nos. 59-60, Gracechurch Street, E.C.—Colonel Stephenson R. Clarke, C.B. (the Chairman), presiding.

The Secretary (Mr. C. J. Daun) read the notice convening the meeting; and the report of the Directors and the statement of accounts were taken as read.

The Chairman said the year that ended in March last brought with it far more matters of moment to the Company than any since he had been a Director. Their late esteemed Chairman, Colonel Daniell, who had been connected with the Company since its inception, felt naturally that he was entitled to a less strenuous position, and resigned the chairmanship in August last. The proprietors would realize how greatly his determination was regretted by his co-Directors, who much appreciated his anxiety at all times to be of service to the Company, and who had experienced during many years his never-failing courtesy and kindness. It was a pleasure to them to think that, though he had retired from the chair, he still retained a seat on the Board, and his advice and long experience were still available. After 35 years of service as General Manager, Mr. J. W. Starkey retired last month. The long period of his service, and the excellence of the work that he did during it for the benefit of the Company, the Directors felt entitled him to a substantial pension; and doubtless the shareholders would approve of their action in granting him £350 per annum. Their Engineer (Mr. A. E. Buckley) had been appointed General Manager in Mr. Starkey's place, while continuing his work as Engineer. He had been with the Company now for over a twelvemonth; and the Board felt that the Company's interests were in very safe hands. To turn to the figures, it would be noticed that the amounts received for gas and paid for coal, oil, &c., were materially higher than a year ago. This did not mean that they had done more business—the contrary was the case. They sold some 13 million c.ft. of gas less. The increase was entirely due to the higher prices of raw material, in consequence of which they had also had to raise the price of gas. At the present time, they were paying £9 per ton for coals, and had had to raise the price of gas in Malta to 11s. 8d. per 1000 c.ft. from Oct. 31. It was the Board's wish—and it would have been a fair thing to have done—to raise the price to 11s. on Sept. 1 last, from the 8s. 8d. at which it had previously stood; but the Government of Malta did not feel able to agree to this without a full investigation. They were, of course, satisfied, after their inquiry, that there were ample grounds for the advance in price; but unfortunately these investigations naturally caused delays, and the award was not given for many weeks. Thus a great deal of revenue was lost to the Company; and, as would be seen from the accounts, it hit the Company very badly. Of course, dear gas checked consumption; and this, coupled with the reduction of the military hospitals at Malta, had considerably reduced the sales. Coke, too, had produced some £1600 less than in the previous year. The coals were received now from the Government, who imported cargoes that were to be used for various purposes; and though the coals were probably as good for such all-round use as could be found, their Manager said they were not equal for gas making to the special gas coals they usually carbonized. They had had, on the average, a reduced make of gas of 1000 c.ft. per ton carbonized. In addition to the other difficulties they had had to contend with, he regretted to say that they had experienced loss in a very regrettable way. There had been some cases of dishonesty among collectors and minor officials at Malta, and also cases of consumers stealing gas. It was hoped that the steps taken by the Directors and Mr. Buckley would produce a healthier and cleaner tone. At the Sicilian stations troubles had been even greater than at Malta; for while at Malta they had been able to get coals—at a price—in Sicily they had often been unprocurable, and it had been necessary to fall back on lignite and even wood, materials of which he must confess he had had no previous experience, as producers of gas. After trying them, he trusted that the Company might speedily be able to obtain a regular supply of coal again, as the cost of producing gas under these circumstances was enormous. It was a great relief to the Directors when the Italian Government informed their representative, Mr. Pucci, that if the Company would continue the supply of gas, they would guarantee them against any loss. The Board hoped and believed that they had passed through the worst of their difficulties; and they had decided to draw from reserve a sufficient sum to enable them to declare a dividend at the rate of 5 p.ct., free of income-tax. He concluded by moving the adoption of the report and accounts.

Mr. A. M. Paddon seconded the resolution, and it was carried unanimously.

Proposed by the Chairman, and seconded by Mr. A. F. Phillips, dividends were declared at the usual rates on the first and second preference capital, and of 3 p.ct. (free of income-tax) on the ordinary capital—making, with the interim dividend paid in December last, 5 p.ct. for the year.

Thereafter the retiring Director (Mr. A. W. Oke) was re-elected, on the proposition of the Chairman, seconded by Mr. Paddon; and the Auditors (Messrs. Burton and W. Cash) were re-appointed, on the motion of Mr. Joseph Cash, seconded by Mr. W. H. Daun.

The Chairman and Directors were thanked for their services.

GLASGOW GAS ACCOUNTS.

Some Further Figures.

In last week's issue [p. 260], there were given the financial results and the principal figures relating to the working during the year ended May 31 last of the Glasgow Corporation Gas Department. The receipt subsequently of the Gas Committee's report (signed by the Convener, Bailie John C. Drummond) enables some further details to be noted.

The number of ordinary meters in use on May 31 was 191,677, as compared with 194,853 for the preceding year—a decrease of 3176. Of prepayment meters there were in use 103,073, as compared with 102,650 for the preceding year, an increase of 423—giving a net decrease of 2753 meters. In the year, 23,511 meters were repaired.

At May 31 there were on loan 135,208 cookers and range fittings, 26,280 grills, 59,007 boiling-burners, 39,494 gas-fires on hire, 409 on hire-purchase, 3545 radiators on hire, and 8 water-heating appliances on hire-purchase, and 1637 on simple hire—a total of 265,588, as compared with 272,468 for the preceding year. The output of these appliances has been much curtailed during the year, owing to the continued difficulty in obtaining supplies, and the reduction of the out-door staff. There were at the same date 1246 gas-engines in use, of a total brake horse power of 19,013. The total length of the mains is 1076 miles. It is stated that at the Provan and Dawsholm Gas-Works the oil-washing plant installed by the Ministry of Munitions has continued to work well; 608,669 gallons of benzol and toluol products having been supplied to the Explosives Department. At the Tradeston works, the oil-washing plant has been started, and is working satisfactorily; 196,390 gallons of benzol and toluol having been produced.

In consequence of the further advances in the cost of coal and the other materials required, and the increasing cost of wages, the Committee regret that they are compelled to again raise the charges for gas. They recommend a scale of rates for adoption as from the 1st inst. ranging from 3s. 9d. to 3s. per 1000 c.ft., according to quantity and purpose of consumption, through ordinary meters within the city supply district. The charge is to be 4s. 2d. to prepayment consumers, and 3s. 4d. for public lamps.

The Committee acknowledge with pleasure the good work done by the whole staff under the continued difficult conditions which have prevailed during another war year. They also wish to record their high appreciation of the services of the General Manager (Mr. Alexander Wilson), who has, under very adverse circumstances, maintained the efficiency of the department.

An analysis of the accounts shows that the cost per 1000 c.ft. of gas made during the past year was 2s. 8·56d., as compared with 2s. 3·07d. in the preceding year; the gross receipts per 1000 c.ft. accounted for being respectively 2s. 9·73d. and 2s. 5·32d.

THE HOUSEHOLD FUEL AND LIGHTING ORDER.

Dr. J. T. Dunn's Comparative Figures.

In reproducing on p. 262 of last week's issue of the "JOURNAL" some interesting comparative figures as to heating and lighting values, sent along by Dr. J. T. Dunn, of Newcastle-upon-Tyne, his argument was unfortunately confused by a printer's error, in repeating for electrical energy the calories already given for gas—thus, as a correspondent points out, destroying the meaning of the 4 : 11 ratio subsequently referred to. The mistake occurred in the second paragraph of the article, which should have read:

The total amounts of heat obtainable from the quantities of the various fuels specified by the Order as equivalent, may be put roughly as follows:

Coal, 1 ton	7,500,000 calories
Coke, 1½ tons.	9,750,000 ,,
Gas, 15,000 c.ft.	1,875,000 ,,
Electrical energy, 800 B.T.U. . . .	688,000 ,,

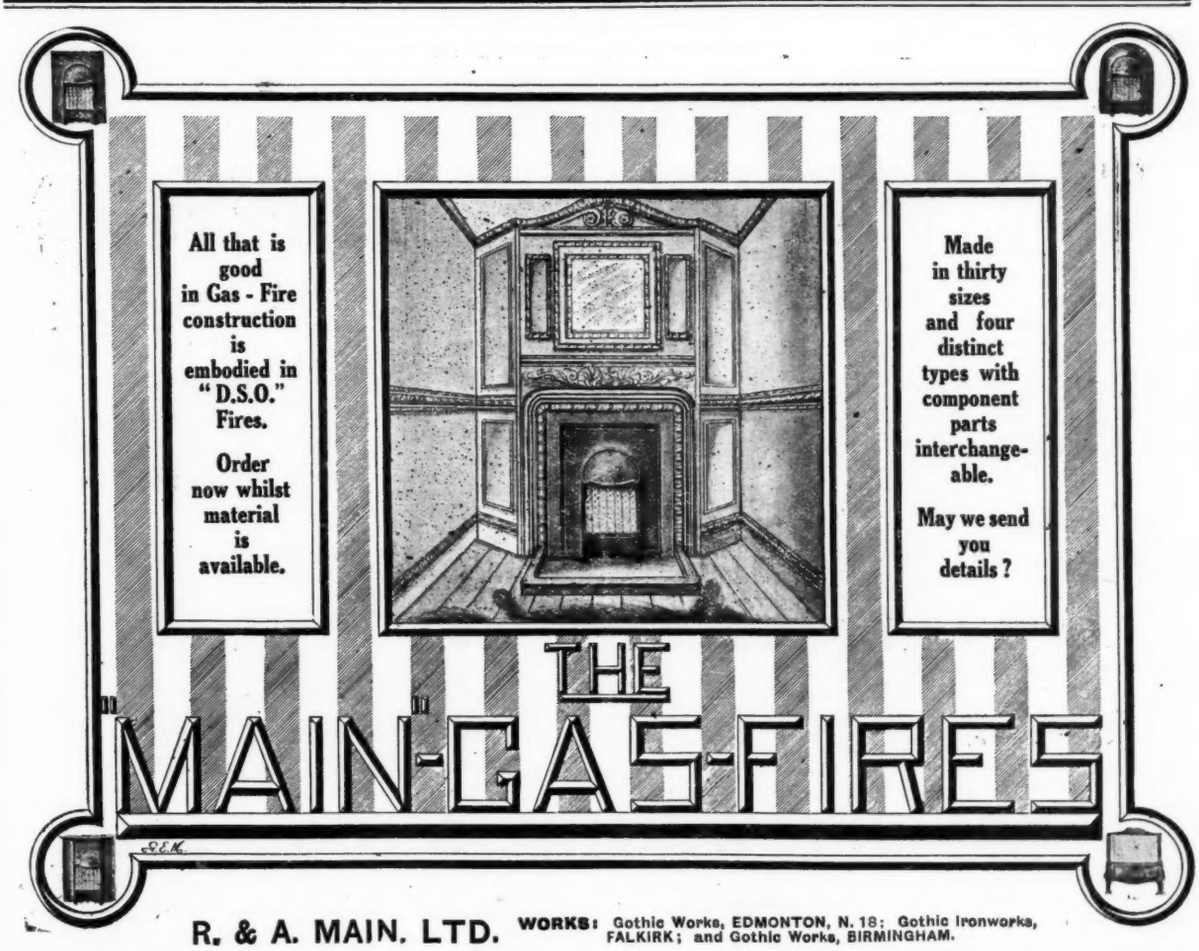
A calorie being the amount of heat needed to raise a kilogram of water through 1° C. of temperature.

BURNLEY GAS-WORKS MANAGEMENT.

The management of the Burnley Gas-Works was again referred to at last Wednesday's meeting of the Town Council, when the following report in the minutes of the Gas Committee was moved for approval by the Chairman (Alderman Emmott): "Mr. J. P. Leather (the Engineer) submitted a statement as to the present position of the management of the gas undertaking, in which he said that the Assistant Manager (Mr. Ashworth) was unable, through failing health, to devote the necessary energy to the work required of him in that position. The Committee recommended the Council to relieve the Assistant Manager from his position, and that other suitable and less onerous work be found for him in the department. The Committee also recommended that an Assistant Manager be advertised for at a commencing salary of £300 per annum."

Mr. SUTCLIFFE moved that the minute be referred back. He thought that, if there was a time in the history of the gas-works when the management needed inquiring into, it was now.

Mr. RIPON seconded. He remarked that he did not find fault with the treatment of Mr. Ashworth, as he believed that he had spent the best part of his life at the works, and therefore deserved some consideration. They had the confession from the Committee that the management of the works had not been satisfactory for some time; and he believed that, in order to cover it up, they were making a


All that is good in Gas-Fire construction is embodied in "D.S.O." Fires.
Order now whilst material is available.
Made in thirty sizes and four distinct types with component parts interchangeable.
May we send you details?
THE MAIN-GAS-FIRES
R. & A. MAIN, LTD.
WORKS: Gothic Works, EDMONTON, N. 18; Gothic Ironworks, FALKIRK; and Gothic Works, BIRMINGHAM.

scapegoat of one individual.' He did not think the bad management was the fault of Mr. Ashworth at all. He alleged that the members of the Gas Committee were all dissatisfied with the way things were going on. They ought to take up the reorganization of the works from top to bottom.

Alderman Emmott asked the Council to approve of the recommendations. He had been on the Gas Committee 23 years; and he could say that, up to the war, the department was looked upon as a model, and was conducted as well as any other works, supplied gas as cheaply, and made as much profit generally speaking. Mr. Ashworth had been in the employ of the department for 44 years; but his health had lately been failing him, and he was not physically fit to carry out the duties they would require from him next winter. Since Mr. Manley (the Superintendent of the Distributing Department) had died, no one had been appointed to fill his place; and they suggested that Mr. Ashworth should have his post, and that they should get a thoroughly good Assistant Manager. Before the war, they got all their coal in the town; but now, because the local colliery firm could not fully supply them, they had to get 20,000 tons from outside, as best they could—colliery firms not tendering. They used a lot of oil; but for the last twelve months they had not been able to get any. They had now secured power to get some for next winter; but it was for nothing like the quantity they wanted to make the gas as it should be. They could not do the impossible. If they had not the works better watched than last year, there was no possibility of getting through the winter in a satisfactory manner, as the difficulties would be far greater. He thought they would all agree that the work which had been put on Mr. Leather had been enormous; and he could not both attend to these duties and always be about the works. If the minute was not approved, it would mean that they would have the winter upon them before anything was done. When war broke out, the Committee had obtained 23 acres of land for new works; and if the war had been a year later in starting, they would have had a new holder capable of containing more than all the present holders. The present capacity was such that there were times when they had difficulty in meeting the demand for gas.

Mr. Irving said that, despite the Chairman's reassurance, there was considerable dissatisfaction about the gas supply. It might be groundless; but it was persistent. He suggested that they should have an independent inquiry into the management and possibilities of the works. Even if this were favourable, it would have the effect of allaying the continuous attacks on the Committee and their work, and give general satisfaction, which would be worth more than the cost of the inquiry. He had yet to understand the point of view of the management. If they had nothing to fear, they ought to welcome it, in a sense of justification.

Alderman Emmott replied that the Committee spent nearly twelve months in looking into this matter; and he did not see what further could be gained. He believed they had as good an Engineer as any works, and one who was looked upon as an expert. They knew the works were not able to do all that was required of them; but as soon as the war was over they would get on with the providing of new works, and put everything right.

Only two voted for the amendment; and the minutes were adopted in their entirety.

SUGGESTIONS FOR SUMMER STREET LIGHTING.

A correspondent who is much interested in the subject dealt with calls attention to the fact that the contributor who supplied the "Journal" with the report headed "Scientific Street Lighting" which appeared on p. 220 of the issue dated July 30, mixed up two distinct matters. At the meeting of the London "Safety First" Council then referred to, the Street Lighting Sub-Committee of the Street "Safety" Committee submitted a report (which was adopted) containing suggestions relating to diminished street lighting and automobile headlights; and these, as our correspondent remarks, "have been confused, or 'fused,' into one in the account published in the "Journal"—some sections being omitted. Perhaps the best way of setting the matter right will be to reproduce in its entirety the section with which our readers are more particularly concerned.

Suggested Reduction of Street Lighting during Summer Months.

That, following an invitation received from a Metropolitan Borough Council, to consider a proposal that certain of the public street-lamps should be put out of lighting during the summer months, they referred this question to their Street Lighting Sub-Committee, who report that, while they recognize the desirability of any practical measures calculated to promote saving in fuel, any apparent advantage in this direction should be carefully weighed against any drawbacks which the extinction of public lighting would involve. That their Sub-Committee have drawn attention to the following drawbacks:

The staffs employed for operating the present limited amount of street lighting would be broken up, and perhaps could not be easily replaced in the winter months or at any other time, if it was decided to restore the lighting.

The suspension of lighting might hinder the police in the execution of their duties, and render more difficult the suppression of crime and disorder in the streets.

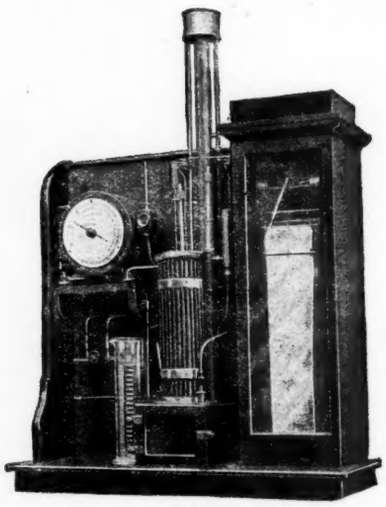
Owing to the variable climatic conditions in this country, there is no certainty that sufficient illumination would be available during the moonlight period. On the other hand, the few small lamps in use do act as a very effective guide as to the direction of the road and assist drivers of vehicles and pedestrians very much, particularly on cloudy nights.

That, in view of the drawbacks in question, the Sub-Committee are

SIMMANCE'S
TOTAL HEAT RECORDING CALORIMETER

¶ The only Recording Calorimeter which combines a Standard Calorimeter and a Recording device.

¶ Simmance's Total Heat Calorimeter is the only Total Heat Instrument on the market, and has been adopted for Official Use in England, Canada, Queensland, &c.



ALEXANDER WRIGHT & CO., LTD.,
1, Westminster Palace Gardens, Artillery Row, Victoria Street, Westminster, S.W.1.

not prepared to recommend the general extinction of lamps in side-streets, but desire to suggest the following measures for adoption, subject to the approval of the authorities responsible for street lighting in the Inner London (approximately the county) area.

By adopting the following measures, the Sub-Committee are of the opinion that inconvenience would be reduced to a minimum:

(*a*) That, in the interests of safety and convenience, and also in compliance with the principles already adopted by the authorities in regard to the public lighting of Inner London (approximately the county) area, there should be greater uniformity of procedure in the various districts, and in the treatment of both main and side streets.

(*b*) That, in the event of it being hereafter found desirable to adopt measures for the general extinction of public lighting in side-streets, precautions should be taken to avoid sudden transitions from brightness to darkness in passing from a main street, where the lighting is of greater power than in the side-streets, to a side-street; and that accordingly the lamp in a side-street nearest to the junction with the main road should be left in lighting, and, if possible, the next nearest light also left, but somewhat diminished, thus carrying out the principle of avoiding excessive contrasts in illumination formulated in the resolution passed by the Council at their meeting on April 17.

CURRENT SALES OF GAS PRODUCTS.

The London Market for Tar, Tar Products, and Sulphate.

LONDON, *Aug.* 12.

In the London tar products market pitch continues the chief item of interest; there being a considerable amount of inquiry for the article. The price is very firm at round about 57s. 6d. per ton net f.o.b. at makers' works. Most of the other tar products are under control, and there is no change to record in them.

In sulphate of ammonia there is a brisk demand; and all available supplies are being readily taken up on the Government terms.

Tar Products in the Provinces.

Aug. 12.

The average values for gas-works products during the week were: Gas-works coal tar, 27s. to 31s. Pitch, East Coast, 30s. to 35s. per ton; West Coast—Manchester 25s. to 30s., Liverpool 25s. to 30s., Clyde 25s. to 30s. nominal. Benzol 90 p.ct., North, 10½d. to 11½d.; 50-90 p.ct., naked, North, 1s. 3d. to 1s. 4d. Toluol, naked, North, 2s. 3d. Coal tar crude naphtha in bulk, North, 7⅞d. to 8¼d. Solvent naphtha, naked, North, 3s. 3d. to 3s. 4d. Heavy naphtha, North, 2s. 11d. to 3s. 1d. Creosote, in bulk, North, 4d. to 4¼d. Heavy oils, in bulk, North, 4⅛d. to 5d. Carbolic acid, 60 p.ct. East and West Coasts, 2s. 6d. to 2s. 9d. naked, nominal. Naphthalene salts, £6 to £7, bags included. Anthracene, "A" quality, 4d. to 6d. per unit; "B" quality, 1½d. to 2d.

FROM A MARKET CORRESPONDENT.

Tar Products.

Market conditions and prices remain without any material alteration. Where changes have occurred, however, they are of small dimensions only, and mostly in favour of holders. This is to a certain extent satisfactory, as what with the increased cost of labour and the recent addition to the price of coal, the costs of production have increased tremendously, without any real redeeming feature from the manufacturer's point of view. This is particularly the case in connection with benzol, toluol, and the naphthas; the first two selling at officially controlled prices, which are considerably below even the pre-war cost of production. Benzol costs over 2s. and toluol 5s. per gallon to produce, yet selling prices were only 1s. and 2s. 4½d. per gallon. Creosote and carbolic acid show practically no change, and cresylic acid remains at 3s. 6d. per gallon. Tar can be bought at 4d. per gallon in bulk. As regards naphthalenes, very little can be said. The refined does not experience great demand, but remains in the neighbourhood of £30. Crudes, however, are wanted rather more, and make from £6 to £12 10s. per ton according to quality. Solvent naphtha is saleable at 4s. to 4s. 6d. in London and 3s. 9d. to 4s. per gallon in the Provinces, and heavy remains at 3s. 3d. per gallon. Aniline oil continues dull at 1s. 2d. Anthracene "A" quality is 4d. to 6d. per unit per cwt., and "B" quality 1½d. to 2½d. The range of quotations is as follows:

Benzol: 90% London, 1s. 0½d., North 10½d. to 11½d.; 50% North 1s. 4d. to 1s. 5d. naked per gallon.

Carbolic Acid: 60% East and West Coast 3s. 6d. per gallon; crystals 40% 1s. 3d. per lb.

Crude Tar: London 32s. 6d. to 35s.; Midlands 27s. to 29s.; North 28s. to 30s. per ton, *ex* works.

Pitch: London 52s. to 55s. f.o.b. works; East Coast, 33s. f.o.b.; West Coast, 31s. f.a.s.; Manchester, 30s.; Clyde 29s.; South Wales 42s.

Solvent Naphtha: Naked London 90-190% 4s. 6d.; North 3s. 9d. to 4s. per gallon; 90-160% naked London 4s. 3d. to 4s. 6d.; North 4s. to 4s. 3d. per gallon.

Crude Naphtha: Naked 30% 8¼d. to 8½d.; North 6¼d. to 6½d.

Naphthalene: Refined £30 to £32 10s.; salts 80s., bags included.

Toluol: Naked, London 2s. 4d.; North 2s. 3d.

Creosote: Nominal, London 4¼d.; North 4d. to 4⅛d. (Government price, 75s. per ton f.o.b.—equal to 4⅜d. per gallon); heavy oil, 4¼d. per gallon in bulk.

Anthracene: "A" quality, 40-45%, 4½d. per unit; "B" quality, 1¾d. to 2¼d.

Britain's Best Mantle

IS THE

VOLKER

The All-British Production of an All-British Company

The VOLKER LIGHTING CORPORATION, Ld.

Garratt Lane, ——— LONDON, S.W. 18.

Cresylic Acid: 95%, 3s. per gallon; 97-99%, 3s. 3d. to 3s. 6d. per gallon, casks included *ex* works London and f.o.b. other ports.
Grease Oils 18° Tw. (naked) £6 per ton f.o.r. makers' works.

Sulphate of Ammonia.

Home agricultural and munitions demands are sufficient to absorb all the make, and there is none left for export, although a few tons at special prices continue to be exported to the Colonies and allied countries on special grounds. Considerable attention is being directed to the synthetic production of ammonia, although few firms are willing to sink capital for its further exploitation, and progress is still being made. Complaints regarding quotations have practically ceased for the time being; but this does not mean that everyone is absolutely satisfied.

A Smart Answer from Hastings.

The Secretary of the Ratepayers' Association at Hastings, in a communication to the local Press, attacked the relief measure which Parliament has allowed to public utility undertakings; and he appears to have accused gas companies of increasing their charges because revenue has fallen owing to the economy of the gas users. Mr. C. F. Botley, the Engineer and General Manager of the Gas Company, has pointed out the absurdity of the line of argument of the Secretary of the Association, and has given him some facts bearing upon the question which it will be difficult—in fact, impossible for him—to dispute. All through the letter Mr. Botley scores, and in the final paragraph of the letter particularly so at the expense of the Corporation Electricity Department. He writes: "There is one other point to which your correspondent might give attention. The Government Bill provides that where undertakers are a local authority, no modification shall be authorized which will increase the statutory maximum charge by more than 50 p.ct., or which is more than sufficient so far as can be estimated to enable the undertaking to be carried on without loss. The local electricity undertaking had a deficiency of £5786 in 1916, £5258 in 1917, and £4628 for the last year. These deficiencies, as usual, have been made up out of the general district rate. Will the Ratepayers' Association advocate to the Corporation that the Gas Company be given a subsidy equal to the amount so granted to the electricity undertaking? If so, I need scarcely say that the price of gas could be considerably reduced; and there would be no need for the 'Relief' Bill to which your correspondent so vehemently objects in the case of the local gas undertaking."

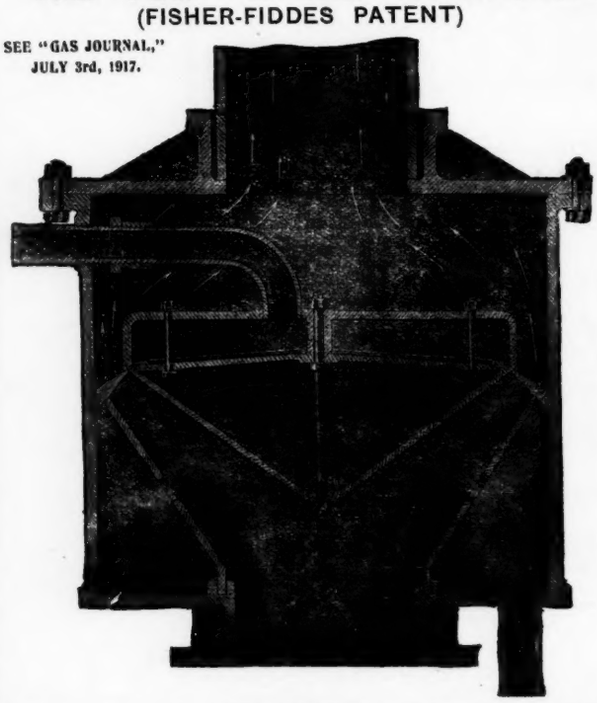
The Ramie Company, Ltd., who are represented at the British Scientific Products Exhibition, at King's College, Strand, W.C., are also exhibiting at the British Industries Exhibition at Glasgow [Stand 90-91], which opens on the 20th inst.

Portsea Island Gas Light Company.

At the half-yearly meeting on Thursday, the Directors will report that, including £1456 drawn from the reserve fund, the profit and loss account for the six months ended June 30 shows an available balance of £12,250, which enables the Directors to recommend a dividend at the statutory rates of 9 p.ct. per annum on the "A" and "B" shares, 8 p.ct. per annum on the "C" shares, 6 p.ct. per annum on the "D" and "E" shares, and 5 p.ct. per annum on the 5 p.ct. (maximum) stock, less income-tax. In the present session of Parliament, 21 Bills were promoted, including the one by the Company, applying for temporary and partial relief from the financial hardships arising out of the conditions created by the war. The promotion of these Bills led to the appointment of a Special Committee of the House of Commons. A Bill was introduced into Parliament on the lines of the Committee's report; but it has since been amended so as to allow, with the sanction of the Board of Trade, of the payment of 7½ p.ct. on the "A" and "B" shares, 6¾ p.ct. on the "C" shares, and 5¼ p.ct. on the "D" and "E" shares. The provisions in the Company's Bill relating to this matter have accordingly been withdrawn. The serious increase in the cost of production—particularly of labour—necessitated a further increase in the price of gas of 6d. per 1000 c.ft. from the last June quarter. An application will in due course be made to the Board of Trade for authority to pay the rates of dividend previously mentioned. In the absence of such sanction, this increase of 6d. in the charge would necessitate a reduction of future dividends to 7½ p.ct. on the "A" and "B" shares, 6¼ p.ct. on the "C" shares, and 4¾ p.ct. on the "D" and "E" shares. Since this increase in the price of gas was decided upon, the price of coal has been further increased by 4s. per ton. The Directors recommend the usual donations of £50 and £5 5s. to the Portsmouth, Portsea, and Gosport Hospital, and the Portsmouth and Southern Counties Eye and Ear Hospital respectively, and also the distribution of coke to the value of £100 among the poor resident within the limits of the Company's supply during the ensuing winter.

Coatbridge Gas Company.—The Directors of the Coatbridge Gas Company report that the statement of accounts and balance-sheet for the year ended June 30 are satisfactory, notwithstanding the treatment meted out to the gas industry by the Government Departments. The total consumption of gas for the twelve months amounted to 293,718,145 c.ft., being an increase of 4,389,951 c.ft. over the corresponding period. The proportion of gas unaccounted for was 8·21 p.ct. The gross revenue from gas, residual products, &c., amounted to £60,102. The Directors recommend the payment of dividends, in accordance with the sliding-scale, at the rate of 10½ p.ct. per annum on the original stock, and £7 7s. p.ct. per annum on the three issues of £10 shares, less income-tax. The price of gas has been raised to 2s. 10d. per 1000 c.ft.; and meter-rent is to be charged at the rate of 5s. per annum.

"TAR FOG" & TAR EXTRACTOR
(FISHER-FIDDES PATENT)
SEE "GAS JOURNAL," JULY 3rd, 1917.



FOR THE
ELIMINATION OF
TAR & TAR FOG
FROM COAL GAS AND
OIL VAPOURS
FROM C.W. GAS
WHY NOT TRY THE
NEW METHOD
AUTOMATIC
EFFECTIVE &
INEXPENSIVE
PARTICULARS AND PRICES FROM
R. & J. DEMPSTER, LTD., MANCHESTER.
LONDON OFFICE: 34, VICTORIA STREET, WESTMINSTER, S.W. 1.

A Loss on the Accrington Gas-Works.

The statement of accounts of the Accrington District Gas and Water Board for the year ended March 31 shows that there was a loss on the gas undertaking of £2983. Mr. W. B. Rhodes, the Accountant, in his report states that there were two advances in the price of coal—of 2s. 6d. per ton, followed by another of 1s. 6d. Coal had been and is very difficult to obtain. The coal carbonized during the year was 37,508 tons—being 1582 tons less than the previous year. The make of gas per ton was 11,315 c.ft., as against 10,341 c.ft.; while the sale of gas per ton of coal carbonized during 1918 was 10,006 c.ft., as against 9341 c.ft. in 1917. The amount received for residuals totalled £22,156, against £19,882—an increase of £2273. The sales of coke amounted to 17,858 tons, for which was received £16,779, or an increase of £2339. Wages had been increased by awards made by the Committee on Production, the amounts paid in the two years being: 1917, £21,052; 1918, £24,308. The amount granted to employees serving with the colours during 1918 was £547, as against £514 during 1917. The loss on the gas undertaking, of £2984, is arrived at without charging for a proportion of the contributions to sinking funds (£2978). The leakage of gas represents 10·3 p.ct.—due, it is said, to the extensive district covered by the Board's area of supply, and the need of new mains.

Newport (Mon.) Gas Company.—At the half-yearly meeting of the Newport (Mon.) Gas Company, Mr. George Geen, J.P., who presided, pointed out that the revenue account submitted again showed a striking increase in gas sales, to the extent of 13 million c.ft., or 6 p.ct., following upon the record increase of 12 p.ct. in the June half of 1917. Against this, however, the price of coal was now 13s. per ton above that of the pre-war period; while, at the same time, grave complaints had to be made of the increasing inferiority, owing to the presence of dirt and ash in the coal supplied. It should not be impossible for the Coal Controller, while granting increased prices to the coal industry, to also impose conditions as to quality. Their Manager (Mr. J. H. Canning) reported that he had had to handle, over the last three months, close upon 3000 tons of perfectly useless matter (so-called coal), which sadly interfered with all their retort-settings, and lowered very considerably the make of gas per ton. Wages, as might have been expected, had become a very serious item; the amount now being 106 p.ct. over the pre-war period of June, 1914. Altogether the cost of manufacture and distribution had increased during the war period to the extent of 2s. 8d. per 1000 c.ft., while the increase in charge made to the consumers had only been 1s. 1d. The net balance amounted to £5994, and there was £548 brought forward; and to this was added £2500 taken from the reserve fund. Out of this sum the usual dividend of 2½ p.ct. on the consolidated stock was declared—leaving, after payment of the debenture interest, £433 to be carried forward.

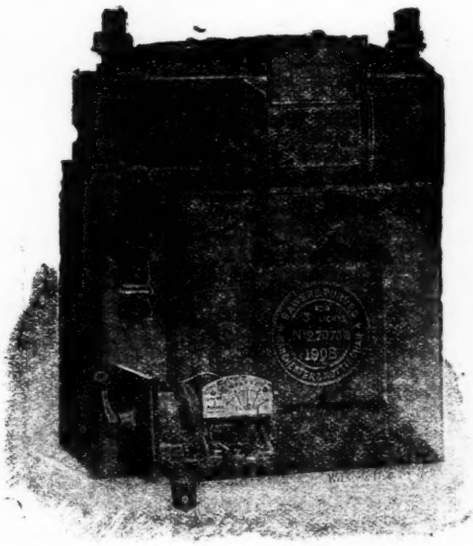
Airdrie Corporation Gas Department.

Mr. A. Kellock (the Engineer and Manager of the Airdrie Corporation Gas-Works) has issued his first annual report, which shows that the amount of gas made during the past year was 124,905,000 c.ft.—an increase of 8,372,000 c.ft., or 7·17 p.ct. The coal carbonized amounted to 11,085 tons, compared with 9972 tons the previous year. The yield of gas per ton of coal carbonized was 11,267 c.ft.—a decrease of 419 c.ft. on the previous year. The total quantity of gas sold was 113,501,575 c.ft.—an increase of 9,219,385 c.ft., or 8·84 p.ct. Public lamps consumed 1,000,355 c.ft., as against 248,550 c.ft. for the preceding year—an increase of 751,805 c.ft., or 302·47 p.ct. The unaccounted-for gas amounted to 5·12 p.ct., as compared with 5·80 p.ct. for 1916-17. The total income of the undertaking amounted to £28,060, against £25,783 for the previous year—an increase of £2277. The gross income from residuals and bye-products amounted to £7108, against £7126 for the year preceding. After deducting the costs of handling and manufacture, the net income from this source amounted to £5498—a decrease of £713 compared with last year. The total expenditure under revenue account was £23,011, compared with £18,261 last year—an increase of £4750. There was an increased expenditure on the manufacture of gas of £4120; being due to the greater quantity and the higher controlled price of coal, increases of wages, and the increased cost of all kinds of stores and material. Distribution of gas cost £1000—an increase of £66. Deducting the total expenditure under revenue account from the total income, there was a surplus balance of £5049 to be carried to the credit of the net revenue account to meet the standing charges. There was an increased expenditure of £975 under net revenue; and the amount at the credit of this account being £6082, as against a total contra expenditure of £7425, there remains a debit balance of £1342 to be carried forward.

Increases in the Price of Gas.—The Audley Urban District Council have increased the price of gas 6d. per 1000 c.ft. There has been a rise of 8d. at Dumfries—making the charge per 1000 c.ft. for ordinary consumers 4s. 2d., prepayment meters 4s. 7d., public lighting 4s. 2d., and gas-engines 3s. 11d. At East Dereham, an increase of 6d. has been made, bringing the charges up to 5s. per 1000 c.ft. for lighting, 4s. 6d. for cooking, and 4s. for trade purposes. An advance of 2½d. per 1000 c.ft. by the Hastings and St. Leonards Gas Company brings the price for ordinary consumers up to 4s. 4½d. per 1000 c.ft. This addition is less than was anticipated would be needed, and represents only the increased cost of labour. Another increase in price has been found necessary at Malton, making the charge 3s. 8d. per 1000 c.ft. An increase for lighting of 6d. per 1000 c.ft. at Montrose, makes the rate 5s. 6d. The charge for gas has been raised at North Berwick from 5s. 7½d. to 6s. 0½d. per 1000 c.ft. The Richmond (Yorks.) Corporation have decided to increase the price of gas from 4s. 2d. to 4s. 7d. per 1000 c.ft.

MILES PLATTING,
MANCHESTER.

SAWER
and
PURVES.
(BRANCH OF METERS, LTD.)



PREPAYMENT
METERS.

RADFORD ROAD,
NOTTINGHAM.

AGENT FOR SCOTLAND
JNO. D. GIBSON,
2, Causeyside St.,
PAISLEY.

APPLICATIONS FOR PATENTS.

[Extracted from the "Official List" for Aug.8.]

Nos. 12,285—12,720.

Aktiebolaget Ingeniörsfirma F. Egnell.—"Gas-analyzing apparatus." Nos. 12,483, 12,588.
Bone, W. A.—"Treatment of fuels to improve their calorific value." No. 12,399.
Booth, W. N.—"Furnaces, &c." No. 12,337.
Boys, C. V.—"Means for economizing heat in fireplaces." No. 12,530.
Cantwell, G. J.—"Hydraulically-operated automatic gas and air valve-gear." No. 12,690.
Coyte, W. A.—"Lighting-device for gas-stoves, &c." No. 12,349.
Cressler, A. D.—"Apparatus for charging and discharging gas-retorts." No. 12,430.
Davidson, W. B.—"Gas-washers." No. 12,334.
Fletcher, J. E.—"Recuperators for furnaces." No. 12,582.
Fletcher, J. E.—"Gas-fired furnaces." No. 12,599.
Garrow, J. R.—"Carbonization of coal, oil, shale, wood, peat, &c." No. 12,509.
Gobeille, O.—"Gas heating-apparatus." No. 12,400.
Gunton, F. W.—"Gas-lighter." No. 12,688.
Helps, G.—"Burners, and combustion of gas in boilers." No. 12,370.
Imray, O.—See Gobeille.—No. 12,400.
Lindsay, H.—"Valves for liquids or gases." No. 12,648.
Liversedge, A. J.—See Davidson. No. 12,334.
Maxted, E. B.—"Removal of ammonia from high-pressure gases." No. 12,684.
Parnacott, A. E.—"Apparatus for determining rate of flow of liquids through jet, &c., orifices." No. 12,428.
Pearson, W. H.—"Distillation of shale, &c." No. 12,590.
Shearer, M.—See Gunton. No. 12,688.
Smeeton-Wright Furnaces.—See Fletcher. Nos. 12,582, 12,599.
Smith, H. E.—"Operation of water-gas plants." No. 12,694.
Smith, T. A.—See Maxted. No. 12,684.
Telephos Domestic and Street Lighting Company.—"Operating electric switches from a distance." No. 12,488.
Tweedale, S.—"Manufacture of gas." No. 12,543.
Wilkinson, A. R. J.—"Gas valves and taps." No. 12,286.
Wright, T.—See Fletcher. Nos. 12,582, 12,599.

Wanganui (N.Z.) Municipal Gas-Works.

Reporting on borough affairs for the twelve months ended March 31, Mr. G. Murch, the Town Clerk of Wanganui, says that, acting upon the recommendations of the Gas Commission, the Council amended their policy in connection with the payment to the Gas Department for the cost of street lighting. The actual expenditure for maintenance, lighting, &c., and the cost of manufacture of the gas used were ascertained, the general account being charged £2054, as against £1030; the difference of £1023 being an additional direct charge on the ratepayers. The Council also fixed the basis on which transfers of gas profits should be made to the general account—namely, 6d. per 1000 c.ft. of gas made. This resulted in the ratepayers being assisted to the extent of £3056, as against £4000 for the previous year—a difference of £943, which, added to the extra charge for street lighting, represents £1967 in favour of the Gas Department. In common with other gas-works of the Dominion, great difficulty has been experienced in securing a sufficient supply of suitable coal, the price for which has considerably increased. To meet the extra cost, the price of gas was raised 6d. per 1000 c.ft. as from June 1 last; and this produced £1950 additional revenue. The Council are now faced with a far greater increase in the price of coal; and unless the selling price of gas is revised, or the policy in respect to the transfer of profits altered, the expenditure cannot be kept within the limits of the revenue during the year. The surplus at the close of the year was £3601, less £90 in hand at the commencement, giving a net surplus of £3501 for the twelve months.

Montrose Gas Light Company.—The annual general meeting of the partners was held on Wednesday, July 17 (Mr. A. Muirden, the Chairman, presiding), when the annual reports were submitted and approved. The balance-sheet permitted a dividend distribution at the same rate as last year. The Manager (Mr. D. M. Macintyre) reported that the gas manufactured was 52,380,000 c.ft., showing an increase of 4,384,900 c.ft., equal to 9·13 p.ct., over last year.

Lincoln Gas Undertaking.—In directing attention, at the last meeting of the Lincoln Corporation, to the city's sound financial position, Alderman Wallis (the Chairman of the Finance Committee) referred specially to the gas undertaking—pointing out that all that is owing upon the works and plant, which are maintained out of revenue, is £106,746. In the balance-sheet, the value of the undertaking is set out at £241,780; and he asked whether anyone to-day would be willing to sell it at double this price. Alderman Wallis (who is Chairman of the Gas Committee, and the oldest member of the Council) has had conferred upon him the honorary freedom of the city, in recognition of his valuable municipal services.

Swindles in Gas Economizers.—In their page of "German News," the "Ironmonger" of the 3rd inst. says: "The householders' fear of being fined for excessive consumption of gas has revived the old 'gas economizer' swindle, for practising which one Gustav Roske has just been sentenced to six months' imprisonment. His method was to call at the houses of well-to-do people and tell the maid that he had been sent by the gas-works to examine the gas-fittings, as too much gas was being consumed. He then produced his so-called gas economizer. If an order was given for the apparatus, he fitted it on there and then, and presented a bill for an excessive amount." This may put English gas folk on their guard.

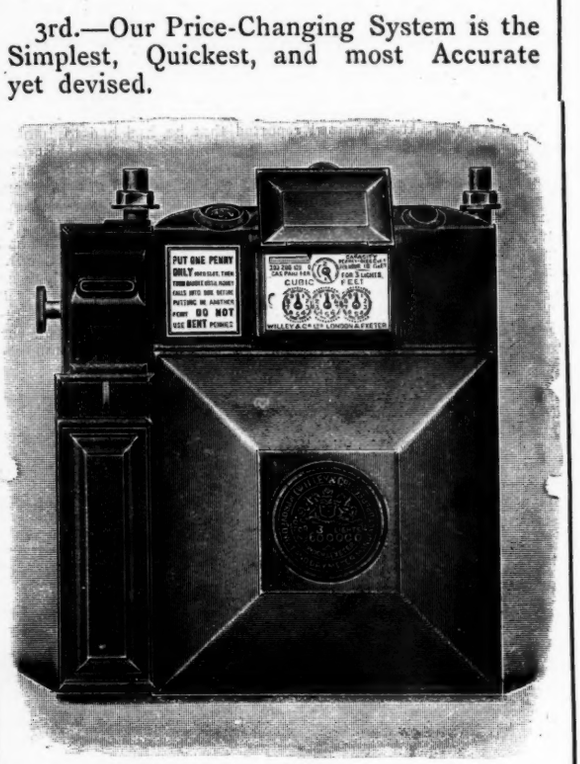
THREE POINTS

of advantage from the many found in our Slot Meters are:

1st.—They are Fraud Proof, and cannot be tampered with through the Slot.

2nd.—The Slot is closed when the maximum number of Coins have been inserted.

3rd.—Our Price-Changing System is the Simplest, Quickest, and most Accurate yet devised.



ALL PARTS INTERCHANGEABLE.

Tens of Thousands in use, and adopted exclusively by many Gas Companies.

WILLEY & CO., LTD.,

Exeter, London, Manchester, Leicester.

Telegrams: "WILLEY, EXETER." "GASVILLADO, KINLAND, LONDON." "METERS, LEICESTER." "WILMETER, MANCHESTER."

Telephone Nos.: 122 EXETER. 234 DALSTON, LONDON. 4777 LEICESTER. 7419 CITY (MANCHESTER).

LONDON WORKS & OFFICES:
89-95, Hertford Road, Kingsland, N.
LEICESTER:
5, Oxendon Street.
MANCHESTER:
John Street, Booth Street West, S.W.

AGENTS FOR SCOTLAND:
D. M. NELSON & CO., 20, WEST CAMPBELL ST., GLASGOW

STOCK MARKET REPORT.

As usual after the intervention of a Bank Holiday, the Stock Exchange last week took some little time to get into its normal stride of activity. But appearances were generally promising almost from the hour of re-opening on Tuesday; and all the principal departments were firm. The cheerful tone increased as day succeeded day, and the astonishing military history of the week unfolded to the public ken, and culminated on Friday, when markets closed in quite a buoyant condition. The old complaint of scarcity of stock, however, was still audible; otherwise prices would no doubt have shown more considerable advances.

The gilt-edged market maintained the strength it has for some time past displayed. Home Government issues were very firm—War Loans notably being in good demand, and Consols not neglected. Indian issues were in request, Home Rails effected further advances, Canadians did fairly well, and Argentines were steady.

The Foreign Market had many strong points; the steady and progressive demand for Russian being again conspicuous. French, Italian, Greek, and Brazilian were firm. In the Miscellaneous Market, Rubber was dullish; but Oil was very firm. Breweries and Shipping were rather easier; but Iron and Steel, Textiles, and Meats were firm.

Business in the Gas Market was no better than moderate, and prices moved rather irregularly, though in no instance did the change amount to very much, whether for or against. Gas Light and Coke and South Metropolitan were fractionally easier; but South Suburban ordinary and West Kent realized better figures, though the quotation was left standing. Imperial Continental was in request, and rose 3½, and European changed hands up to 10¼.

Bargains done for cash during the week were as follows: On Tuesday, Continental Union 32, European 10¼, Gas Light ordinary 62¼, 62½, 63, 63¼ ditto preference 67½, 67½, ditto debenture 55, 55⅝, Imperial Continental 88¼, Primitiva 28s. 6d., ditto preference 51s. 9d., South Metropolitan 67, ditto debenture 54½, 54¾. On Wednesday, Commercial 4 p.ct. 59⅜, 59½, 59¾, Gas Light ordinary 62¼, 62½, 62⅝, 62¾, 63, ditto maximum 53, ditto preference 66½, 67, 67½, Imperial Continental 88¼, 89, 89½, Malta and Mediterranean 74s. 6d., 75s., Primitiva 28s. 6d., 29s. 6d., South Metropolitan preference 89, Malta and Mediterranean preference 85s. On Thursday, Gas Light ordinary 62, 62⅜, 62½, ditto maximum 52, 53, ditto preference 67½, Imperial Continental 90, 90¼, 90½, Primitiva 28s. 3d., ditto preference 52s., South Metropolitan 67, ditto debenture 54, South Suburban preference 74. On Friday, Bournemouth preference 9⅞, Brentford "A" 72, British 30⅜, 30½, Commercial 4 p.ct. 59½, Continental Union 32, European 10½, Gas Light ordinary 62½, 63, ditto maximum 53, ditto preference 66½, Imperial Continental 90¼, 90½, 91, Primitiva 28s. 9d., 29s., South Metropolitan 66, 66½, ditto debenture 54½, South Suburban 69¾, 70, ditto preference 74½, ditto (West Kent) 63, British (Norwich) 4 p.ct. debenture 66, ditto (Potteries) 3 p.ct. debenture 50.

In the Money Market, rates ruled easy for the most part. The Bank rate is 5 p.ct., as fixed on April 5, 1917.

ANTE-WAR PRICES AND DIVIDENDS, LATEST DIVIDENDS, AND LAST WEEK'S BARGAINS.

Issue. £	Share.	When last Dividend.	Ante-War Dividend & Bonus p.c.	Last Dividend.	NAME.	Closing Prices. July 30, 1914.	Present Prices.	Lowest and Highest Prices of Bargains.
183,049	Stk.	Mar. 10	4	4%	Aldershot 4 p.c. Pref.	..	55—60	..
1,551,868	,,	April 8	2½	4⅜	Alliance & Dublin Ord.	59—64	50—55	..
874,000	,,	July 10	4	4%	Do. 4 p.c. Deb.	76—79	57—62	..
230,000	5	April 29	7½	8⅝	Bombay, Ltd.	57—62	5—5½	..
50,000	10	Feb. 26	16	12½	Bournemouth Gas and Water { 10 p.c.	29—32	21—23	..
882,110	10	,,	7	7%	Bournemouth Gas and Water { B 7 p.c.	15—15½	10½—11	..
115,000	10	,,	6	6%	Bournemouth Gas and Water { Pref. 6 p.c.	13½—14	9—9½	9⅜
159,740	—	—	—	4%	Bournemouth Gas and Water { 4 p.c. Deb.	..	66—68	..
992,045	Stk.	Feb. 26	14	4⅘%	Brentford A Consolid.	261—266	73—76	72
734,920	,,	,,	11	4⅘%	Do. B New	204—209	65—68	..
55,000	,,	,,	5	5%	Do. 5 p.c. Pref.	109—111	77—82	..
221,400	,,	June 11	4	4⅘%	Do. 4 p.c. Deb.	91—93	62—64	..
317,980	,,	Feb. 26	11	9%	Brighton & Hove Orig.	208—218	135—140	..
344,300	,,	,,	8	6⅘%	Do. A Ord. Stk.	154—159	95—100	..
590,000	20	Mar. 26	13½	22/6	British	44—45	30—31	30⅜—30½
120,000	Stk.	June 26	4	4%	Do. 4 p.c. Deb. Stk.	88—90	64—66	..
345,771	,,	,,	4	4%	Buenos Aires 4 p.c. Deb.	85—87	50—53	..
100,000	10	—	—	—	CapeTown & Dis. Ltd.	1½—2½	3⅞—4½	..
100,000	10	—	—	4⅘%	Do. 4½ p.c. Pref.	4—6	7—8	..
100,000	Stk.	June 26	4½	4⅘%	Do. 4½ p.c. Deb. Stk.	70—75	60—65	..
157,150	,,	Feb. 26	5	5%	Chester 5 p.c. Ord.	108—110	79—81	..
1,518,220	,,	Feb. 12	5/9/4	30/-†	Commercial 4 p.c. Stk.	106—108	57—62	59⅜—59½
560,000	,,	,,	5½	30/-†	Do. 3½ p.c. do.	103—105	54—59	..
475,000	,,	June 11	3	3%	Do. 3 p.c. Deb. Stk.	69½—71½	51—53	..
600,000	,,	,,	4	—	Continental Union Ltd.	76—79	30—35	32
200,000	,,	,,	7	—	Do. 7 p.c. Pref.	115—118	55—60	..
378,400	—	—	—	11⅛%	Croydon B and C 7 p.c.	..	150—160	..
—	—	—	—	10%	Do. E	..	..	..
493,270	Stk.	—	6	5⅘%	Derby Con. Stk.	125—126	95—100	..
55,000	,,	—	4	4%	Do. Deb. Stk.	103—104	80—83	..
1,009,180	10	July 29	10	5/0	European, Ltd.	17½—18	9½—10½	10¼—10½
16,298,975	Stk.	Feb. 10	4/17/4	99/4	Gas Light and Coke { 4 p.c. Ord.	98—102	62—64*	62—63½
2,600,000	,,	,,	3½	3⅘%	Gas Light and Coke { 3½ p.c. max.	76—79	51—53	52—53
4,092,225	,,	,,	4	4%	Gas Light and Coke { 4 p.c. Con. Pref.	96—99	66—68	66½—67½
4,674,850	,,	June 11	3	3%	Gas Light and Coke { 3 p.c. Con. Deb.	72½—74½	54—56	55—55⅝
180,000	,,	,,	10	10%	Gas Light and Coke { 10 p.c. Bonds	..	..	..
258,740	,,	Mar. 12	5	3⅘%	Hastings & St. L. 3½ p.c.	87—89	46—51	..
70,000	10	April 29	11	6%	Hongkong & China, Ltd.	16½—16¾	7—8	..
86,600	—	—	—	9⅛%	Hornsey 7 p.c.	..	115—125	..
181,000	Stk.	Mar. 12	7½	7%	Ilford A and C.	151—154	90—95	..
65,780	,,	,,	6⅝	5⅘%	Do. B	115—118	70—75	..
65,500	,,	June 26	4	4%	Do. 4 p.c. Deb.	92—94	62—65	..
4,940,000	,,	May 14	9	4⅘%	Imperial Continental	150—160	89—92	88¼—91
1,235,000	,,	Feb. 12	3½	3⅘%	Do. 3½ p.c. Deb. Red.	84—86	66—68	..
235,343	,,	Mar. 12	6½	6⅛%	Lea Bridge Ord. 5 p.c.	119—121	92—97	..
2,498,905	,,	Feb. 26	10	5%	Liverpool 5 p.c. Ord. { A / B	211—213 / 146—148	82—84	..
306,068	,,	June 26	4	4%	Do. 4 p.c. Pr. Deb. Stk.	..	71—73	..
75,000	5	June 11	6	2/-	Malta & Mediterranean	4½—4⅝	3⅝—3⅞	7s/6—7s/0
250,000	100	April 1	4½	4½%	Met. of Melbourne { 4½ p.c. Deb.	99—101	88—99	..
541,920	20	May 28	4	6/-	Monte Video, Ltd.	11½—12	8⅜—9½	..
1,875,823	Stk.	July 29	4½	3⅘%	Newcastle&Gatsh'd Con.	98½—99½	67½—65½*	..
539,705	,,	June 26	3½	3⅘%	Do. 3½ p.c. Deb.	62—63	59—61	..
55,940	10	Feb. 26	7/14/0	7%	North Middlesex 7 p.c.	14—15	9½—10½	..
800,000	Stk.	May 14	8	8%	Oriental, Ltd.	117—122	101—108	..
60,000	5	Mar. 26	10	1/-	Ottoman, Ltd.	7½—7¾	3—4	..
60,000	50	Feb. 26	18	9%†	Portsea, Island B	128—131	80—85	..
100,000	50	,,	12	8%†	Do. C	118—121	75—80	..
62,000	50	,,	10	6%†	Do. D	..	..	..
249,980	5	April 29	8	—	Primitiva Ord.	5½—6	1⅜—1⅝	28 3—29.6
499,960	5	June 26	5	2/6	Do. 5 p.c. Pref.	4½—5	2½—2⅞	51/9—5½/-
521,600	100	June 2	4	4%	Do. 4 p.c. Deb.	91—98	75—77	..
—	—	—	—	4%	Do. ,, ,, 1911	..	53—54	..
846,198	Stk.	June 26	4	4%	River Plate 4 p.c. Deb.	86—87	55—60	..
150,000	10	May 14	6	6/-	San Paulo { 6 p.c. Pref.	10½—11	7½—7⅞	..
125,000	50	July 1	5	5%	San Paulo { 5 p.c. Deb.	47—49	40—42	41
185,000	Stk.	Mar. 12	10	10%	Sheffield A	228—234	174—177	..
309,984	,,	,,	10	10%	Do. B	229—234		..
538,500	,,	,,	10	10%	Do. C	230—232		..
90,000	10	May 28	9	6/-	South African.	10½—11½	10—11	..
6,609,295	Stk.	Feb. 10	5/4/0	32/-†	South Met. 4 p.c. Ord.	111—118	66—68	66—67
—	—	—	—	—	Do. Pref.	..	91—93	89
1,895,445	,,	July 10	3	3%	Do. 3 p.c. Deb.	72½—74½	53—55	54—54½
294,920	,,	Feb. 26	8½	6%	South Shields Con. Stk.	157—159	121—123	..
952,795	,,	,,	6	3⅘%†	S'th Suburb'n Ord. 5 p.c.	114—116	68—71	69½—70
60,000	,,	,,	5	5%	Do. 5 p.c. Pref.	110—112	73—75	74—74½
135,000	—	—	—	3⅘%†	Do. West Kent	..	..	63
187,558	Stk.	June 26	5	5%	Do. 5 p.c. Deb. Stk.	116—118	82—84	..
647,740	,,	May 14	5	3%	Southampton Ord.	99—102	74—76	..
120,000	,,	Feb. 12	7½	5⅘%	Tottenham District { A 5 p.c.	135—138	90—95	..
782,275	,,	,,	6	4%	Tottenham District { B 3½ p.c.	115—117	65—67	..
181,355	,,	June 26	4	4%	Tottenham District { 4 p.c. Deb.	87—89	61—63	..
189,380	10	Dec. 30	5	—	Tuscan, Ltd.	5—6	1—2	..
149,900	10	July 1	5	5%	Do. 5 p.c. Deb. Red.	93—95	45—50	..
236,476	Stk.	Mar. 12	5	5%	Tynemouth 5 p.c. max.	103½—109½	87—88	..
80,000	,,	Feb. 26	6⅜	67/6	Wandsworth, Wimbledon, and Epsom—Wandsworth A 5 p.c.	151—156	90—95	..
255,536	,,	,,	6¼	52/6	Do. B 3½ p.c.	129—134	70—75	..
108,075	,,	,,	5/17/3	47/3	Do. C 3½ p.c.	110—115	70—75	..
352,000	,,	,,	6¼	45/3	Wimbledon 5 p.c.	117—122	70—75	..
98,000	,,	,,	6¼	52/6	Epsom 5 p.c.	121—126	70—75	..
88,416	,,	June 26	3	3%	5 p.c. Deb. Stk.	66—69	48—51	..

* Ex Div. † Next Dividend will be at this rate.

Messrs. John Terry & Co., as Agents, have received from the Metropolitan Gas Company of Melbourne cabled advice informing them that the profits for the half year ended June 30 last were £98,168. A dividend of 6s. 6d. per share has been declared for the six months, a sum of £30,000 has been transferred to the reserve fund, and a balance carried forward of £72,266. Dividends were probably payable in Melbourne on the 1st inst.; and drafts to absentee shareholders would be posted by the first mail thereafter.

WANTED, FOR SALE, CONTRACTS, &c., ADVERTISEMENTS IN THIS WEEK'S "JOURNAL."

Appointments, &c., Vacant.

LADY FOR ADVISORY WORK AND CHARGE OF SHOW ROOM. Darlington Gas Department.

ASSISTANT MANAGER. Burnley Corporation. Aug. 26.

SUPERINTENDENT. Coventry Corporation. Aug. 24.

CHEMIST AND DRAUGHTSMAN. Aldershot Gas, &c., Company.

CARBONIZING FOREMAN. Chesterfield Gas-Works.

FOREMAN (PURIFICATION). Croydon Gas Company.

WORKING FOREMAN. Horsham Gas Company.

JUNIOR ASSISTANT CHEMIST. No. 6479.

Spent Oxide.

BIRMINGHAM (Windsor Street) Gas-Works.

Plant, &c., for Sale.

WET GAS METER (1200 c.ft.). Haddon-Caxton Engineering Works, Market Harborough.

Plant, &c., Wanted.

COKE BREAKER. Weymouth Water Company.

Patent Licence.

GAS MANTLES. D. Young & Co., 11 & 12, Southampton Buildings, W.C. 2.

Meeting.

RIDDINGS DISTRICT GAS COMPANY, No. 139, Cannon Street, E.C. Aug. 29, 2.30 o'clock.

NOTICES TO CORRESPONDENTS, ADVERTISERS, AND SUBSCRIBERS.

No notice can be taken of anonymous communications. Whatever is intended for insertion in the "JOURNAL" must be authenticated by the name and address of the writer—not necessarily for publication, but as a proof of good faith.

COPY FOR ADVERTISEMENTS for the "JOURNAL" should be received at the Office NOT LATER than TWELVE O'CLOCK NOON ON MONDAY, to ensure insertion in the following day's issue.

Orders to Alter or stop PERMANENT ADVERTISEMENTS should be received by the FIRST POST on Saturday.

Wanted, For Sale, and Tender Advertisements, Six Lines and under 3s.; each additional Line, 6d.

TERMS OF SUBSCRIPTION to the "JOURNAL."

United Kingdom: One Year, 23s. 6d.; Half Year, 12s.; Quarter, 6s. 6d. Payable in Advance. If credit is taken, an extra charge of 4s. a year is made.

Abroad (in the Postal Union): £1 7s. 6d., payable in advance.

In payment of subscriptions for "JOURNALS" sent abroad, Post Office Orders or Bankers' Drafts on London only are accepted.

All Communications, Remittances, &c., to be addressed to WALTER KING, 11, BOLT COURT, FLEET STREET, LONDON, E.C. 4.

Telegrams: "GASKING, FLEET LONDON." Telephone: Holborn 6857.

OXIDE OF IRON.

O'NEILL'S OXIDE
FOR GAS PURIFICATION.
LARGEST SALE OF ANY OXIDE.

SPENT OXIDE PURCHASED IN ANY DISTRICT

GAS PURIFICATION & CHEMICAL CO., LD., PALMERSTON HOUSE, OLD BROAD STREET, LONDON, E.C.

"VOLCANIC" FIRE CEMENT.
Resists 4,500° Fahr. Best for Gas-Works. ANDREW STEPHENSON, Gresham House, Old Broad Street, LONDON, E.C. "Volcanism, London."

BRITISH GAS PURIFYING MATERIAL.

ENGLISH BOG ORE AND NATURAL HYDRATED OXIDE OF IRON.
SPENT OXIDE BOUGHT.

BRITISH GAS PURIFYING MATERIALS CO., LTD.
(W. T. P. CUNNINGHAM, Chief Proprietor and Managing Director.)
13, ARCADIAN GARDENS, WOOD GREEN, LONDON, N. 22.
Telegrams: "Bripurimat, Wood, London." 'Phone: Palmer's Green 608.

SULPHURIC ACID.

SPECIALLY prepared for the manufacture of SULPHATE OF AMMONIA.
SPENCER CHAPMAN & MESSEL, LTD., with which is amalgamated WM. PEARCE & SONS, LTD.
Mark Lane, LONDON, E.C. WORKS—SILVERTOWN.
Telegrams—"HYDROCHLORIC, FEN, LONDON."
Telephone—1588 AVENUE (3 lines).

ALDER AND MACKAY, LTD.
(ESTABLISHED 1850.)
WET AND DRY METERS,
SLOT AND ORDINARY.
STREET LAMPS AND AUTOMATIC CONTROLLERS.
EDINBURGH.
(See p. 322.)

NEWBURN, ELLIS, AND FRYOR.

CHARTERED PATENT AGENTS AND TRADE MARK AGENTS,
70, Chancery Lane, London.
Telegrams: "Patent London." 'Phone: 248 Holborn.
And 8, St. Nicholas Buildings, Newcastle-on-Tyne.

"FERROX." "FERROX." "FERROX."

A BRITISH Oxide Cheaper and Better than Bogore. 85 per cent. Water; 75 per cent. Ferric Hydrate. For Sale outright or on Loan.
OXIDE LIMITED, Brentford, MIDDLESEX.

SEND your inquiries for Carburetted HYDROGEN AND BLUE WATER-GAS PLANT, also TAR DEHYDRATING PLANT and other GAS-WORKS APPARATUS to—
BALE AND HARDY,
39, VICTORIA STREET, WESTMINSTER, S.W. 1.

SULPHATE OF AMMONIA SATURATORS and all LEAD and TIMBER WORK in connection with Sulphate Plants.
We Guarantee promptness with efficiency for Repairs.
JOSEPH TAYLOR AND CO., CENTRAL PLUMBING WORKS, BOLTON.
Telegrams—"SATURATORS BOLTON." Telephone 0848.

J. & J. BRADDOCK (Branch of Meters Limited), Globe Meter Works, OLDHAM, and 45 & 47, Westminster Bridge Road, London, S.E. 1.
WET AND DRY GAS-METERS, PREPAYMENT METERS, STATION METERS AND GOVERNORS.
REPAIRS RECEIVE PROMPT ATTENTION.
Telephones: 815 Oldham, and 2412 Hop, London.
Telegrams—
"BRADDOCK, OLDHAM," and "METRIQUE, LAMB LONDON."

BENZOL PLANTS FOR GAS-WORKS.

BAGLEY, MILLS, & Co., Ltd.,
92, Victoria Street, Westminster, S.W. 1., Invite inquiries from all gas-works making 75 million cubic feet and upwards per annum.

SPENCER'S Patent Inclined **HURDLE GRIDS.**

THE very best Patent Grids for Holding Oxide Lightly.
See Illustrated Advertisement, May 28, p. 363.

J. E. C. LORD, Ship Canal Tar-Works' Weaste, Manchester. Pitch, Creosote, Benzols, Toluol, Naphtha, Pyridine, all kinds of Cresylic Acid, Carbolic Acid, Sulphate of Ammonia, &c.

GAS-WORKS requiring Extensions should Communicate with FIRTH BLAKELEY, SONS, AND CO., LIMITED, Dewsbury, who make a Speciality of Catering for the Smaller Gas Concerns. Prices Reasonable; quality and results, the best. Satisfaction Guaranteed.

COVENTRY CORPORATION.
(GAS DEPARTMENT.)

APPLICATIONS are invited for the Position of SUPERINTENDENT of the Foleshill Gas-Works, Coventry.
Salary, £350 per Annum.
Applications, stating Age, and giving full Particulars of Training and Experience, together with Three recent Testimonials, to be addressed to the Chairman of the Gas Committee, and sent in not later than Aug. 24, 1918.

P. N. LANGFORD,
Engineer and Manager.
Gas Offices,
Coventry.

COUNTY BOROUGH OF BURNLEY.
(GAS DEPARTMENT).

ASSISTANT Manager wanted. Commencing salary £300 per annum.
Applications, giving full particulars of age, education, mechanical and technical training and references, to be sent to the Gas Engineer, Gas-Works, Burnley, endorsed "Assistant Manager," not later than Monday, the 26th of August next.

PEREGRINE THOMAS,
Town Clerk.
Town Hall,
Burnley,
Aug. 1, 1918.

WANTED—Junior Assistant Chemist for Tar Works Laboratory to do Eight Hours Shift Work, in Metropolitan Area.
Apply, by letter, to No. 6479, care of Mr. KING, 11, Bolt Court, FLEET STREET, E.C. 4.

ALDERSHOT GAS, WATER, AND DISTRICT LIGHTING COMPANY.

WANTED, for the Ash Road Gas-Works—as Second Assistant—CHEMIST and DRAUGHTSMAN. Capable of Gas and Gas Products Analyses, &c. Commencing Salary, £160 per Annum, *plus* 12½ p. ct. War Bonus.
Apply, by letter, stating Age, Particulars of Training, and Experience, with *copies* of recent Testimonials, to the undersigned.

W. FISH,
Secretary.
Chief Office,
Victoria Road,
Aldershot.

WANTED—A Lady specially Trained in Gas Cookery, capable of taking up ADVISORY WORK and CHARGE of SHOW-ROOMS.
Applications, giving References, Experience, Training, and Salary required, to Mr. FRANK P. TARRATT, Engineer and Manager, Gas Department, DARLINGTON.

OXIDE OF IRON.
SPENT OXIDE WANTED.

BALE & CHURCH, LTD.
38, ST. MARY AT HILL, LONDON, E.C. 3.
Phone: Avenue 6680.

"TORTO" FIRE CEMENT.

BALE & CHURCH, LTD.
38, ST. MARY AT HILL, LONDON, E.C. 3.
Phone: Avenue 6680.

"KLEENOFF," THE COOKER CLEANSER.
Tins for sale to Consumers.
In Bulk for Works Use.

BALE & CHURCH, LTD.
38, ST. MARY AT HILL, LONDON, E.C. 3.
Phone: Avenue 6680.

WANTED—Good Carbonizing Fore-MAN, accustomed to Regenerative Furnaces, Sulphate Making, and General Gas-Works Routine. Wages, £3 10s. per Week.
Apply, stating Age, Experience, &c., with *copies* of One or Two recent Testimonials, to Mr. W. T. BUCKLAND, Engineer, Gas-Works, CHESTERFIELD.

THE Croydon Gas Company require the Services of an Intelligent Man to act as FOREMAN of Purification Department. He must have had Good Experience in Similar Work. Age not to exceed 35. Commencing Wages, £2 2s. per Week, with War Bonus 18s., *plus* 12½ p. ct.
Apply, giving Particulars of Experience, to Mr. A. CADDICK, Engineer, Gas-Works, CROYDON.

HORSHAM GAS COMPANY, LIMITED.

WANTED, at once, for a 40 Million Works, a WORKING FOREMAN with Knowledge of Water Gas Plant and Good General Gas-Works Experience.
Apply, stating Wages required, to the MANAGER, Gas Office, London Road, HORSHAM, Sussex.

COKE Breaker Wanted—Small Size, with Adjustable Rollers, Pulleys, &c., Complete.
Full Particulars to WATER-WORKS COMPANY, WEYMOUTH.

SPENT OXIDE.

REQUIRED about 250 Tons of Fused Rock-Hard SPENT OXIDE—50 p.ct. Sulphur—for Cyanide Purposes.
State Lowest Price for Immediate Delivery to the ENGINEER, City Gas-Works, Windsor Street, BIRMINGHAM.

PURE WHITE SULPHATE OF AMMONIA.

FREE Acid reduced almost to vanish-ing point by a special process easily installed and no extra working costs. Patent applied for.
Arrangement can be made at once for the application of the process.
The only payment is that of a small annual fee.
All particulars from No. 6478, care of Mr. KING, 11, Bolt Court, FLEET STREET, E.C. 4.

WET Gas-Meter for Sale.—Makers, Parkinson's, London. Capacity, 1200 c. ft. per hour. Size, 36 in. by 41 in. Barrel Shape. In First-Class Condition.
Apply to HADDON-CAXTON ENGINEERING WORKS, MARKET HARBOROUGH.

GAS PLANT for Sale.—We can always offer New and Second-Hand Gas Apparatus, including Retorts and Fittings, Condensers, Exhausters, Scrubbers, Washers, Purifiers, Gasholders, Tanks, Valves, Connections, &c. Also a few COMPLETE WORKS. Compare Prices and Particulars before ordering elsewhere.
FIRTH BLAKELEY, SONS, AND CO., LTD., CHURCH FENTON, near LEEDS.

THE Proprietors of British Patents Nos. 25,516 of 1906; 25,588 of 1906; 11,152 of 1908; 28,943 of 1910; 4763 of 1912; 4772 of 1912; 8429 of 1912; 20,291 of 1912; and 11,591 of 1914, relating to the "MANUFACTURE OF INCANDESCENT GAS-MANTLES," desire to enter into Negotiations, with one or more Firms in Great Britain, for the Sale of the Patent Rights or for the grant of Licences to Manufacture under royalty.
Inquiries to be addressed to D. YOUNG & Co., Patent Agents, 11 & 12, Southampton Buildings, LONDON W.C. 2.